

OP53 presentation

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OP53 presentation

Part I

**Detailed analysis of Contract
and recommended
modifications.**

Summary and Recommendation

Operating Procedure No. 53 (OP53) is a new OP for the PMOCs to use as part of their contract scopes as part of the 2009 awards. As noted below, OP53 is a broadly scoped product that has potential to deliver project or package level assessments. However, it has also overlaps with other OP products and more problematically contains requirements for review elements (procurement system and financial capacity assessment) that the PMOC clearly doesn't have the expertise to deliver. On the other hand, it has gaps in scope in the form of first, addressing review requirements for non-construction work packages such as real estate, force account, etc.; secondly integrating all package level assessments for both construction and non-construction work packages into a project level picture of cost and schedule and thirdly, where these are OP53 and 54 products delivered which product (53 or 54) delivers the project level assessment?

Lastly, it requires the PMO to deliver risk products without any guidance on to conduct package assessments, or integrate them into a project level picture of cost and schedule.

Aside from these general implementation issues, there are Region II specifics in the form of technical capacity and capability (TCC) and specific mitigation capacity (SMC) requirements in the execution plans and PMP direction letters that drive the requirement to modify OP53 using the discretion afforded to the Region in Section 6.0 of OP53 to deliver satisfactory package level assessments. Therefore, a Region II specific OP53 outline that works within the existing OP53 framework is developed and presented. This Region II specific outline is consistent across NJT, MTA and PANYNJ projects and suitable for use by the three PMOC teams. It also provides for a handoff to the follow on package level OP product, OP54.

This is a separate whitepaper being developed on OP54 issues and implementation recommendations which will be coordinated with this paper, but the recommendation of this paper is that the OP53 product is more suitable for integrating the mix of package level OP53 and OP54 products using a single project level OP53 product. This clearly excludes the situation in the future for Region II projects where all design packages have been awarded, or completed construction and therefore, only OP54 products are active and therefore a project level OP54 would be used to develop a picture of cost and schedule forecasts for RSD.

Background

a. OP 53 Background

The purpose of the OP 53 Oversight Procedure is to present the PMOC's findings, analyses and recommendations with respect to grantee's readiness to bid the major construction and equipment contracts. FTA and PMOC review of the grantee's readiness to bid work helps to ensure:

- Grantee has developed the design documents to an appropriate level of completion given
- the selected delivery method;
- Bid packages and supporting documents are complete, accurate, and consistent with
- project management plans;
- Grantee has established a plan for bid/award that follows accepted best industry practices;

- Grantee's organization at the agency and project office level is prepared to successfully manage procurement and construction.

The OP53 review is divided into the following three areas:

1. Confirmation of Grantee's readiness for bidding of complete bid packages, including plans, specifications, and contract provisions;
2. Confirmation that the bid package is consistent with project management plans with respect to scope, schedule, and budget;
3. Confirmation of the readiness of the agency and project office organization with respect to having in place the necessary qualified project staff; consistent project management plans, procurement and construction management procedures; needed interagency, third party, and real estate agreements; and required financial resources.

b. OP53 Requirements and Analysis

OP53 presents in a tabular format, specific details and requirements for each of the three review objectives and the following is a synopsis of those requirements (*with FTA Region II comments in italics*):

Objective: Confirmation of the readiness for bidding of the complete bid package is accomplished by the following specific reviews:

Construction Plans and Specifications: It asks the PMOC to “confirm” (sic) that the Plans and Specifications completely and clearly define the required Work Review by qualified engineer(s) with expertise in the area(s) of design.

- *The key question in this review scope is to define what management systems and constituent elements are to be evaluated by the PMOC in order to offer FTA assurances that this is indeed the case. This will be discussed further below.*

Construction Contract: Again, asking the PMOC to “confirm” that the Construction Contract completely and clearly defines the terms and conditions under which the Work will be performed.

- *Same comment as above.*

Quality assurance records: The PMOC is to confirm that quality assurance checks and reviews have been performed in accordance with the approved Quality Assurance Plan.

- *Same comment as above.*

Construction Cost Estimate: The PMOC is to confirm that the estimate as prepared is consistent with the Plans, Specifications, and Contract General and Special Conditions, and that it is based upon contemporary cost information.

- *Presumably, the PMOC is not to perform the equivalent of a OP33 cost review. In this case, the grantee's cost management plan should be sufficient as a guide to review the package estimate.*

Objective: Confirmation that the Bid Package is consistent with the Environmental Documents and previously accepted project management plans.

Plans, specifications, and special contract conditions with respect to Environmental Documents:

The PMOC is to confirm compliance of the Work to be constructed with ... (that required by ..) the Environmental Documents.

- *The key question in this review scope is to define what management systems and constituent elements are to be evaluated by the PMOC in order to offer FTA assurances that this is indeed the case. This will be discussed further below.*

Plans, specifications, and special contract conditions with respect to Contract Packaging Plan:

The PMOC is to assess and evaluate the consistency between the Bid package and the Contract Packaging Plan ..(with particular attention) paid to risk allocation / transfers and interfaces between contracts.

- *Contract Packaging Plans historically have at best given a package level work breakdown structure, high level budget and schedule data and contract interfaces. They have not given the type of information discussed above. An analogous statement would be to assess and evaluate grantee management's control over contract deliverables up thru award. See further discussion below.*

Plans, specifications, and special contract conditions with respect to Project Master Schedule:

The PMOC is to assess and evaluate the consistency between the Bid package and the Project Master Schedule ..(with particular attention) to be paid to schedule contingency for delay and rebid, and ensuring that predecessor activities will not interfere with construction per the Bid Package schedule (examples: preceding contractors, utilities relocations, real estate acquisition).

- *This appears to be a mini OP34 review at the package level. See further discussion below.*

Construction Cost Estimate with respect to Project Budget: The PMOC is to assess and evaluate that the Construction Cost Estimate plus appropriate contingencies is "affordable" within the overall Project Budget.

- *This appears to be a mini OP33 review at the package level. See further discussion below.*

Objective: Confirmation that the Grantee has completed all the necessary precursors to construction, and is ready to enter the construction phase of the project.

Third Party Agreements: The PMOC is to confirm that necessary third party agreements are in place to support the construction ..(with)... particular attention ... provided to design standards; inclusion of betterments; and timing of reviews, permits, land transfers, and funds transfers.

- *The key question in this review scope is to define what management systems and constituent elements are to be evaluated by the PMOC in order to offer*

FTA assurances that this is indeed the case. This will be discussed further below.

Real Estate Management Plan: The PMOC is to confirm that all required real estate will be available when required without impacting construction.

- *The key question in this review scope is to define what management systems and constituent elements are to be evaluated by the PMOC in order to offer FTA assurances that this is indeed the case. This will be discussed further below.*

Procurement Policies and Procedures: The PMOC is to ensure Procurement Policies and Procedures are in place that are in compliance with federal policies, ensure a fair bidding environment, and are able to efficiently resolve issues and disputes that may arise during the course of the Construction Contract..(with particular attention paid to) ... Procurement Policies and Procedures (including procedures related to advertisement, bidding, award, disputes, changes, payment, etc.)

- *This appears to be a package level procurement systems review. This will be discussed further below.*

Project Staffing Plan: The PMOC is to ensure that the Project Sponsor has adequately implemented a project staffing plan that ensures the necessary qualified staff will be available to manage and support the Work that is being bid ..(with particular attention paid to) ... Project Sponsor's plans for hiring or transferring staff to support the project.

- *This appears to be a project level assessment of the grantee's technical capacity (TCC). This will be discussed further below.*

Financing Plan: The PMOC is to ensure that money will be available to pay the Contractor for the Work on a timely basis.

- *This appears to be a package level assessment of the grantee's financial capacity. This will be discussed further below.*

OP53 then goes on to define specific management plans and sub plans that should be reviewed as part of the delivering the final product and requires a reporting format consisting of the following:

- 1) Executive summary in three pages or less that includes the following:
 - a) Synthesis of findings on scope, schedule, and cost;
 - *Again, as noted above, this appears to be requiring a set of mini OP32,33 and 34 products... This will be discussed further below.*
 - b) Characterization of significant uncertainties in terms of likelihood (probable, remote, improbable) and their consequence (catastrophic, critical, serious, moderate, marginal);
 - *This appears to be a package level risk assessment. This will be discussed further below.*
 - c) Professional opinion regarding the reliability of the project scope, schedule and cost and the ability of the project sponsor to manage the project;

- *This appears to be a package level TCC assessment and in part redundant to the topic above. This will be discussed further below.*
 - d) Statement of potential range of cost (lower, upper bound and most likely);
 - *This also appears to be part of a package level risk assessment. This will be discussed further below.*
 - e) Recommendation to FTA (if PMOC considers a recommendation appropriate) of the project (or bid package) to proceed with bidding;
 - *This appears to ask the PMOC to give the Region a Go/No Go opinion on “allowing” the bid to go forward. Absent a specific program restriction such as a conditional entry into Final Design, or Letter of no Prejudice, normal practice would be to let the grantee manage the project and not impose a condition where FTA has the ability to place a “hold” on advertising a contract. This will be discussed further below.*
- 2) Review procedures and personnel (including capsule of reviewers’ qualifications; to the extent possible, the reviewers should be same individuals that performed the prior review of the project documents, and should be regular participants in project reviews)
- 3) Readiness of Plans and Specifications;
- a) Design quality;
 - *Appears to be redundant with the QA/QC comment below.*
 - b) Contract;
 - c) QA/QC;
 - d) Cost Estimate;
- 4) Consistency with Environmental Document and Project Plan;
- a) Consistency with Environmental Document;
 - b) Contacting Plan;
 - *This should have been a reference to the project management plan. The Contract Packaging plan is a subplan of the PMP and rolls up under it. There may have been other management plans that are relevant to the review. This will be discussed further below.*
 - c) Consistency with Master Schedule;
 - *Presumably, the PMOC is not to perform the equivalent of a OP34 schedule review. In this case, the grantee’s schedule management plan should be sufficient as a guide to review the package schedule.*
 - d) Consistency with Budget;
 - *Presumably, the PMOC is not to perform the equivalent of a OP33 cost review. In this case, the grantee’s cost management plan should be sufficient as a guide to review the package budget.*
- 5) Agency Readiness;
- *Again, the question is.. is this a mini TCC assessment... a package level TCC?*

- a) Staffing;
- b) Real estate;
- c) Third party agreements;
- d) Procurement policies and processes;
 - *How is this PMOC review different than a procurement system review?*
- e) Funding availability;
 - *How is this PMOC review different than financial capacity review?*
- 6) Conclusions / Mitigation of any shortcomings (detailed, including dates);
- 7) Provide back-up information in appendices.

c. General OP53 Implementation Issues

Based upon the above analysis, several implementation issues arise and are discussed below:

1. Project Level versus Contract Package

With the exception of OP53 and 54, all of the other OP products are implicitly project level assessments. OP32 looks at a characterization of project scope that may entirely built up from package level assessments. But it looks for the PMOC to aggregate its findings into a project level picture and offers little guidance on the package level issues in design development. The same could be said for OP33 and OP40 products...

OP53 clearly has elements that are addressed to the project level. The first review objective is for ..” readiness for bidding of complete bid **packages**..”(emphasis added on the plural). The second review objective is for package consistency with presumably project level management plans which is clearly package level. The third review objective is agency and organization readiness which without further clarification which isn’t in OP53 is arguably a project level review, not package.

- *Therefore OP53 as written is predominately a project level review but package level review elements.*
- *Given that package level assessments of themselves are only useful in developing aggregates, or a project level assessment; delivery of any number of OP53 package level products should normally be accompanied with a project level OP53 product.*
- *Again from an operational view, it is very likely on any FFGA project that the PMO will be delivering a mix of OP53 and OP54 products. (In Region II, this is exactly the case.) Given the discussion above, there has to be a project level product, arguably using OP53's project level scope to integrate the findings from this mix of OP53 and 54 products.*
- *Lastly, OP53 is directed to construction packages, it only indirectly references non-construction work packages such as real estate, etc. Clearly, any project level assessment based upon package level products is only effective when it includes assessments of all work packages, construction and non-construction. Therefore, package level OP53 products must cover non-construction work packages and project level OP53 products must integrate all work package assessments into a project level view.*

2. Overlaps among OPs

OP53 in several places requires the PMOC to deliver products that are either very similar or identical in concept to those in other OPs:

- The requirements for the Executive Summary in the OP53 product direct the PMOC to provide an opinion as to the ... reliability of the project scope, schedule and cost and the **ability of the project sponsor to manage the project...**(emphasis added). In OP21 which is entitled Technical Capacity and Capability Reviews notes in its purpose that this review is to assess the “Grantee’s management, organization, and technical capability to effectively and efficiently plan, develop, **manage** and implement a Federally-assisted capital project. (emphasis added). Additionally, OP53 asks the PMOC to evaluate the adequacy of the grantee’s project staffing plan, another OP21 scope element. This is an overlap with OP21 and given the project level references the question is does OP53 require a package level TCC assessment? What would a package level TCC assessment entail? Does it add any value over that of a project level assessment such as envisioned in OP21?
 - *Grantee management of the construction contract package in design development is instructive to their overall approach to project implementation. It is also helpful in assessing risk in either a pre-bid, or post award scenario. Therefore, specialized and focused assessments of grantee's management of the package development process are recommended.*

- In a similar vein OP53 calls for the PMOC to evaluate numerous management plans without specifically mentioning the project management plan, even though all the plans cited are in fact part of the PMP. This is an overlap with OP20.
 - *As noted above, assessments of grantee’s management of the design development for the contract package is recommended. Management plans and subplans such as the immediately above offer support for and document grantee’s technical approach to project implementation and thereby it Technical Capacity. Therefore, an evaluation of management plans is recommended.*
- OP53 requires the PMOC to present in the executive summary a ..” Synthesis of findings on scope, schedule, and cost.” This overlaps the scopes for OP32,33 and 34. The OP33 and 34 overlaps are discussed below. As to OP32, its checklist and structured review process are not referenced in OP53.
 - *Assessments of grantee’s management of the package scope in terms of conformance with the project packaging plan, package configuration and change management, work breakdown structure and contingent scope identification is critical to evaluating the grantee’s implementation of the project. Therefore, an evaluation of package scope is recommended.*
- OP53 requires the PMOC as part of the discussion on Construction Cost Estimate with respect to Project Budget, ...to assess and evaluate whether the Construction Cost Estimate plus appropriate contingencies was “affordable” within the overall Project Budget. OP33 notes in its objectives that ...” Later, ... when contract packages are conceived, the PMOC will evaluate the estimates in the packages. This review may be performed prior to issuance of documents for bid, or during construction.”
 - *One aspect of evaluating grantee’s management of the package development process is to assess its ability to deliver the package within management baselines inclusive of staying within budget and on schedule. Therefore, an evaluation of package budgets and estimates is recommended.*
- OP53 requires the PMOC to develop opinions on ..”the reliability of the project scope, schedule and cost”,... “potential range of cost (lower, upper bound and most likely)”.. This overlaps with the OP40 Risk Management scope.
 - *In the Final design phase, any assessment of reliability of project budget or schedule must be built up upon package assessments of the same. OP40 offers no specific guidance on performing package level assessments other than general requirements for Beta modeling. Extension of the PG46/47 risk range modeling done in Region II for ARC and the two MTA projects would have to be integrated into a project level model in order to account for the covariance among the packages. Package level risk registers are an unscripted form of the PG46/47 models and similarly could be used when integrated into a project level model that accounted for covariance such as*

the beta model. Lastly, a decision tree is another form of modeling but has not extensive experience in FTA's risk program to date.

- *Therefore, in order to meet OP53's requirements and provide a basis for a valid project level rollup of the package level results, Beta modeling working off of package level WBS elements and the PG46/47 template data is recommended. This framework also provides a handoff between the OP53 and 54 products that allows the PMOC to provide risk inputs for developing an estimate at completion (EAC) in the post award phase.*
- Similar overlaps exist with respect to OP34 schedule reviews, OP23 Real Estate and OP24 QA/QC reviews.
 - *Expressing concerns over schedule and other plans such as real estate and QA/QC is rational but FTA's experience and guidance to date has been at the project level. Adapting that experience to package level guidance is another matter. These reviews elements are recommended but their implementation will require adapting PG/OP34 techniques to a smaller application and will be discussed further below.*

3. PMO Scope issues within the OP

OP 53 requires the PMOC to deliver products that are either very similar to those delivered by other contractors:

- OP53 requires the PMOC to express opinions on the extent to which the grantee's procurement system complies with Federal requirements which is the same scope as the procurement systems contractor scope... OP53 also requires the PMOC to express opinions on the ..."extent to which the grantee's procurement system complies with Federal requirements ..." which is the same scope as the procurement systems contractor scope.
 - *PMOCs are not procurement systems experts, nor is it in their scopes to perform system reviews. This is not a recommended scope item.*
 - *However, from a risk management point of view, grantees often are required to develop specific risk transfer planning as part of their package development process. This risk transfer planning often has to go thru a procurement process where these risk items are discussed with proposers and then negotiated into contract language and payment terms. It would be appropriate for the PMOC to evaluate the effectiveness and efficiency of the grantee risk management process for evaluating what risks to transfer, the reasonableness of their transfer costs and its business decision to retain certain risks.*
 - *Therefore, it is recommended that the PMOC be tasked with evaluating those aspects of the procurement process that are associated with grantee's risk management plans.*

- *It should be noted that there are other areas of package development that are classical applications of PMOC efforts such as evaluating the constructability of the package, pre-construction planning, bidding procedures, milestones, liquidated damages, etc..*
- Similarly, OP53 asks the PMOC to assess and evaluate the grantee's Financing Plan to .."ensure that money will be available to pay the Contractor for the Work on a timely basis." which is clearly contract scope in the Financial Capacity Assessment contractor's scope.
 - *The PMOCs don't have the scope or the expertise to deliver financial capacity products. Therefore, it is not recommended that the PMOCs deliver this part of the OP53 product.*
 - *The more critical question in this is to recognize that to some degree all grantee organizations manage cash flow and operate even to a minor degree in a fiscally constrained environment. In most cases, this is prudent in reducing the financing costs associated with the project. Therefore, an appropriate PMOC scope item is to evaluate whether grantee business decisions on the timing or delay of project work elements that may have the benefit of reducing requirements for use of project contingency of any form or otherwise may give the appearance (real or potential) of being "fiscally constrained" are made with an adequate consideration of relevant risks and impacts. This is recommended to be a part of the OP53 product.*

d. Region II requirements background for OP53 reviews

Region II as part of its programmatic decision process to either allow the grantee to enter into Final Design as in the case of ARC, or amend the existing FFGA such as in the case of ESA and SAS projects performed risk assessments of these projects to develop management baselines and outline technical capacity and capability (TCC) and specific mitigation capacity requirements (SMC) for going forward. These requirements were reduced to writing in the form of execution plans that contained both project level and package level requirements with specific design package development requirements in the PMPs for NJT's ARC and MTA's ESA and SAS. These requirements often apply to both construction and non-construction work packages.

Therefore, it is critical that the PMOC is scoped for and ready to deliver package level OP53 assessments that address project specific TCC and SMC requirements as laid out in the project specific execution plan and subsequent PMP direction letters for all project work packages (construction and non-construction).

This is not meant to preclude project level assessments by the PMOC on large scale management plan elements or issues such as Construction contract administration, safety, QA/QC, etc.

Therefore, it is also critical that the PMOC is scoped for and ready to deliver project level OP53 assessments that integrate all underlying OP53 work package assessments and OP54 contract package assessments into a single, coordinated picture of project cost and schedule as well as demonstrate conformance with project specific TCC and SMC requirements as laid out in the project specific execution plan and subsequent PMP direction letters.

e. Region II Proposed Modifications to OP 53

OP53 provides in Section 6.0 Scope of Work that review items may be modified somewhat to accommodate the particular circumstances associated with a project such as those in Region II. As noted above, a number of modifications are necessary for the resultant OP53 products to meet FTA's expectations and to extend the work accomplished to date in developing technical capacity and capability (TCC) and specific mitigation capacity requirements (SMC) that successfully mitigate project risk. Also as noted above, these TCC and SMC requirements were reduced to writing in the form of execution plans that contained both project level and work package (construction and non-construction) requirements in the PMPs for NJT's ARC and MTA's ESA and SAS. OP53 products will be required to integrate a mix of OP53 and 54 package level assessments into a single, coordinated project level picture of cost and schedule. Lastly, certain limitations are proposed on the OP53 scope that is not clearly within the expertise of the PMOC teams.

1. Project Level versus Work Package

OP53 products must be clearly focused as either project level or work package level reviews and within that to either construction package or non-construction package. Each has specific oversight objectives and must meet be configured to deliver specific opinion elements that support the desired review objectives. There must also be a clear process or migration path for moving OP53 data, information and opinions up into a global, or project level picture for FTA management.

Region II has implemented an oversight process that sets targets for the grantee design development process and its major product, the construction contract package. Package level assessments of these construction contracts in development will form the bulk of the PMOC effort in the near future.

It is critical that the PMOC is scoped for and ready to deliver package level OP53 assessments that address project specific package level OP53 assessments that address project specific TCC and SMC requirements as laid out in the project specific execution plan and subsequent PMP direction letters.

Therefore, Region II would modify the OP53 scope within the Section 6.0 authority to clarify package level versus project level assessment objectives, consistent with the package specific requirements in the project execution plan, providing a framework for

developing package level (OP53/54, construction and non-construction) risk data and forecasts that can then be integrated into a global, project level picture.

The particulars of this modification will be set forth below in the Region II OP53 product outline.

2. OP overlap issues

As part of a Region II OP53 product, the PMOC will assess grantee's management of the package development process inclusive of scope, cost and schedule in terms of conformance with the project level and package level management plans, project packaging plan, package configuration and change management, work breakdown structure and contingent scope identification.

The PMOC shall also assess grantee's ability to deliver the package within management baselines inclusive of staying within budget and on schedule.

Lastly, the PMOC shall develop package level formal risk models (Beta modeling) working off of package level WBS elements and the baseline PG46/47 template data. OP53 products shall also provide a handoff between the OP53 and 54 products that allows the PMOC to provide risk inputs for developing an estimate at completion (EAC) in the post award phase.

The particulars of these modifications will be set forth below in the Region II OP53 product outline.

3. PMO Scope issues

As part of a Region II OP53 product, the PMOC will not be scoped to deliver procurement system review products but shall be directed to evaluate the effectiveness and efficiency of the grantee risk management process inclusive of evaluating what risks to transfer, the reasonableness of their transfer costs and its business decision to retain certain risks. The PMOC shall also review the grantee's as evaluating the constructability of the package, pre-construction planning, bidding procedures, contract administration requirements, commercial terms, schedule milestones, pay structure, liquidated damages.

Further, the PMOC shall evaluate whether grantee business decisions on the timing or delay of project work elements that may have the benefit of reducing requirements for use of project contingency of any form or otherwise may give the appearance (real or potential) of being "fiscally constrained" are made with an adequate consideration of relevant risks and impacts.

Lastly, absent a specific program restriction such as a conditional entry into Final Design, or Letter of no Prejudice, no PMOC requirement for a bid/no bid recommendation would be delivered as part of an OP53 product.

The particulars of these modifications will be set forth below in the Region II OP53 product outline below.

f. Region II Proposed Outline for Package Level (construction contract) OP53 products

Based upon the above analysis and recommendations, Region II OP53 products that are targeted towards grantee contract packages shall be consistent with the following:

The PMOC readiness report shall include:

Part I: Executive summary in three pages or less that includes the following:

- a) Synthesis of project level components that impact package development and delivery;
- b) Synthesis of package management baselines and conformance with management plans;
- c) Synthesis of findings on package level scope, schedule, and cost;
- d) Professional opinion regarding the reliability of the project scope, schedule and cost and the ability of the project sponsor to manage package development.
- e) If directed, a statement of potential range of cost and schedule;

Part II: Review procedures and Personnel (including capsule of reviewers qualifications; to the extent possible, the reviewers should be same individuals that performed the prior review of the project documents, and should be regular participants in project reviews)

Part III: Package Chronology inclusive of two sections, one for PreAward and if directed, another for Post Award. The PreAward chronology shall describe and discuss in an introductory manner package transmittals and progress reporting, configuration management and change control actions, material decisions that impacted cost and schedule, management baselines and other controlled data and grantee direction. The PreAward chronology shall separately discuss procurement history in terms of acquisition and source selection planning, addendums, technical evaluation and price analysis materials, negotiation records and recommendations for award.

The Post Award chronology shall discuss contractor performance, configuration management, and contract administration actions inclusive of changes, disputes and payments and then contract acceptance.

Part IV: Project Level Management Plan and Process Issues. In this section, the PMOC shall discuss project level management elements inclusive of management plans, subplans and procedures that impacted the development of the contract or work package in an adverse manner and validate their application details to the package development. Ordinarily this analysis will not duplicate previous PMOC work

validating project level management plans and processes, but only focus on elements that were not part of the previous reviews.

This analysis shall be sectioned into at least three subsections as follows:

- Design Development:
- Preconstruction Planning:
- Other

Part V: Package Level Management Baseline Data. In this section, the PMOC shall assess and evaluate the grantee's process for establishing package level baselines and managing package development using this management baseline data. PMOC shall also identify what management baseline data was used in developing and awarding this package. Describe and discuss modifications to baseline data/documents for scope, cost and schedule, baseline traceability thru procurement phase.

Part VI Project Level Verification. In this section, the PMOC shall verify that the package as being developed or as delivered in partial, intermediate, or completed submittals complied with management plans, subplans and procedures. (The underlying premise in this part of the review is that the grantee's plans, etc. have been brought into conformance with specific execution plan and PMP direction letter requirements.) The review shall address the following review objectives:

- Evaluate the interface between the design and preconstruction elements of the package and the effectiveness of the design effort to generate construction consideration materials for preconstruction planning.
- Design documentation consisting of design intent and the basis of design was produced in conformance inclusive of narrative descriptions of the package and its issues and presents the issue or package component with clear and useful background information.
 - "Design intent" is defined as documentation that provides the explanation of the ideas, concepts, and criteria.
 - "Basis of design" is defined as the documentation of the primary thought processes and assumptions behind design decisions that were made to meet the design intent and describes the systems, components, conditions and methods chosen by the design professionals to meet that intent.

The PMOC shall assess the extent to which the detail of both the design intent and basis of design are increased as the design process progresses.

- Inclusion of Contingent Scope for Construction Consideration items such as dewatering and ground improvement in the Budget and Schedule.
- Pre-Construction Planning
- Consistency of Cost and Schedule Package Level products and documentation with package management baselines.

Part VII: Demonstrated Management Capacity and Control in Design Development.

Grantee must demonstrate it has implemented and maintains management processes inclusive of design management and control that delivers package products and services at all levels (contract specific and work package) throughout project implementation that are totally sufficient and of an acceptable quality level (1) to establish their usefulness as a management tool (2) and demonstrate that grantee is controlling the package schedule (3) and therefore the forecast for the project's budget and revenue service date are reliable.

The following review objectives shall form the basis for the PMOC's assessment:

- Management of package scope has been sufficient to support grantee's ability to control project requirements by engaging stakeholders (internal and external) to produce positive outcomes by implementing and maintaining a consistent and documented approach to design development inclusive of requirements documentation, interim design submissions, design related and pre-construction planning deliverables and a formal redesign process in conformance with best known industry practices.:
 - Configuration Management and change controls have been effective in controlling package scope and conformance with management baselines. Changes to project scope or baselines have been made with adequate consideration of cost and schedule risks and impacts and reflect sound engineering judgment.
 - Grantee business decisions on the timing or delay of project work elements that may have the benefit of reducing requirements for use of project contingency of any form or otherwise may give the appearance (real or potential) of being "fiscally constrained" are made with an adequate consideration of relevant risks and impacts.
 - Package development has clearly identified contingent scope in its deliverables and indicated budget/contingency treatments and potential third party risk transfers, evaluated the economics of that transfer, established trade off ranges for such transfer. Grantee has also formally documented its analyses and rationale for its business decision to either allocate or retain risk between itself and prospective contractors.
 - The Design Consultant has provided documentation to the grantee in transmittal and status documents that discusses the state of completion for each of the specific key areas of the project design, the assumptions made, and variances from project baselines,(i.e, critical issues summary);
 - Grantee has obtained sufficient information and discussion elements on potential problems and issues for the package within consultant progress reports and demonstrates effective decision-making and risk mitigation.
 - Package development is guided by workplans or functional equivalents that provided management with critical information in the area of key

assumptions and design objectives that identify major tasks for the package inclusive of design basis, design considerations, design coordination requirements, deferred package scope, and design to budget considerations.

- EIS mitigation requirements that are material in package development are traceable thru design and preconstruction documentation into the package as awarded.
- CWBS, or package level WBS is implemented and functions with the following:
 1. identification, estimation, scheduling, and budgeting of all package level work, whether deterministic or probabilistic (Contingent);
 2. providing auditable and traceable summaries of internal data;
 3. WBS elements serve as a logical summary level for assessing technical accomplishments, supporting the required event-based technical reviews, and for measuring cost and schedule performance in a manner that does not constrain the ability to define or manage the package;
 4. WBS dictionary that defines in-depth the scope for each work element; documents assumptions about the work, including deliverables, milestones/key performance parameters, and quantities (if applicable); lists required resources and processes to accomplish the work; identifies a completion schedule, including measurable milestones; and provides links to key technical design or engineering documents.
- Package development process results in budget, schedule and preconstruction products that are adequately supported by narrative description or basis documentation, product objectives/issues, identifiable constraints, clear and useful background information, the purpose of the schedule, what alternatives were available, how the proposed budget or schedule will meet those objectives or resolve those issues and why this schedule approach was chosen above others by grantee; and third parties such as the PMOC have been able to reconstruct any material element in the development of these products solely on the basis of such documentation.

Part VIII: Demonstrated Management Capacity and Control in Procurement

Using the general guidelines given above for design development, the PMOC shall evaluate grantee's management control of the package deliverables thru contract award of the package. Specific review objectives include review of integrity of package management baselines throughout the procurement process inclusive of addenda and negotiations up thru issuance of NTP and conformed contract materials.

Part IX: Package Level Risk Management

Where the package has not been awarded yet, the PMOC may be directed to evaluate the grantee's mitigation of project definition risk (requirements, design and preconstruction solutions and project delivery method risk) by means of quantitative (beta modeling) or qualitative modeling as directed by the work order manager.

The end objective of the OP53 product with award of the package is to hand off to the follow on OP54 product a package level assessment of grantee retained risk that can be used as the basis for developing a package and project level EAC.

Part XI: Conclusions and Mitigation Recommendations

Appendices: Provide back-up information in appendices.

OP53 presentation

Part II

**OP53 Prototype used in
2008 to communicate cost
risks to FTA management for
the ARC Project**

All Readers are hereby instructed of the following limitation on any use of this report:

Third Party Disclaimer

This deliverable and all subsidiary reports are prepared solely for the Federal Transit Administration (FTA). This risk-informed evaluation and assessment should not be relied upon by any party, except FTA or the project sponsor, in accordance with the purposes of the evaluation and assessment as described below.

For projects funded through FTA's Major Capital Investment (New Starts) program, FTA and its PMOCs use a risk-informed assessment process to review and validate a project sponsor's budget and schedule. This risk-informed evaluation and assessment process is a tool for analyzing project development and management. Moreover, this process is iterative in nature; any results of an FTA or PMOC risk-informed evaluation and assessment represent a "snapshot in time" for a particular project under the conditions known at that same point in time. The status of any evaluation or assessment may be altered at any time by new information, changes in circumstances, or further developments in the project, including any specific measures a sponsor may take to mitigate the risks to project costs, budget and schedule, or the strategy a sponsor may develop for project execution.

Determination of the Project Base Year Cost

Using the NJT ARC SCC workbook base year cost of \$6.634bn (2007\$s) and removing the \$891mm in allocated base year contingency gives a base of \$5.743bn (say \$5.75bn) net of contingency (2007 Base year \$s) prior to any adjustments. [Reference the NJT ARC SCC Inflation worksheet, dated January 17, 2008] This was used to produce the grantee's YOE estimate of \$7.646bn (YOE\$s).

This January 2008 SCC workbook had costs for 174 Coaches and 22 Locomotives, 196 vehicles in total that were budgeted at \$471mm (2007\$s). Following a series of meetings in the week of August 11, 2008 between FTA Region II and the grantee's project office, the grantee organization proposed for purposes of establishing a possible FFGA scope, reducing this vehicle compliment from 196 to 100 Coaches and 10 Locomotives, 110 vehicles in total that were now budgeted at \$232mm (2007\$s); a reduction of \$239mm (2007\$s).

[What proof of this offer do we have?.. has the grantee documented this anywhere?]

[This reduction represented the elimination of vehicles being purchased out in the 2017 and 2018 timeframe according to the grantee inflation data in its January 2008 workbook.]

This Vehicle change reduces the base year cost from \$5.75bn to \$5.50bn, before any adjustments as recommended below.

Recommended Adjustments to Base Year Cost and Risk Ranges

- D1 Milestone..
 - Outcomes
 - Stakeholder Issues.. Amtrak supplying Traction power (Cost risk of 2%) and shared facilities, NYC DEP and Water Tunnel 1, NYCMTA shared facilities...
Base of \$5.5bn, risk at 0-15%, NJT working on Amtrak agreement, moving NYPSE, etc.. [Base year 2007 \$s] **\$0 - \$825mm**
- D2 Milestone
 - NEPA scoping review
 - Malanka Landview
 - Cost Issues... Construction changes on off gas; post construction requirements to off site the flue gas... Environmental site assessments for NY... Wetlands mitigations issues...
 - Base of \$5.5bn, risk at 2.5%, \$137.5mm, say \$140...
[Base year 2007 \$s] **\$0 - \$140mm**
- D3 Milestone...
 - PDM Review
 - Market Risk: Unrealistic estimates of number of bids received; single bid premiums
 - Cost Issues: NJT estimated risk premium at \$209mm; PMO (IEI) estimated \$230mm. NJT stated that this was in the estimate as unidentified, or "latent" contingency. *PMO/Burns and Program evaluations did not support this.*
 - FTA contingency target for Entry into FD is predicated upon mitigation of PDM risk. Unmitigated PDM risk is an adder to the target of 20% as discussed below.
 - \$209mm is (3.8%) Base of \$5.5bn (2007\$s) say **\$200mm.**
 - Program Recommendation from geotechnical analysis below is \$400mm for PDM/Market risk...combining PMO and Program recommendations.
 - *At the August 14, 2008 meeting, grantee representations were accepted.*
[Base year 2007 \$s] **\$0 - \$400mm**
 - Construction Indirects...(Still to be resolved is labor incentives, labor availability contractor contingencies which would be "embedded" into the indirects) [See scope review below....]

Page Summary:[2007\$s, no mitigation scenarios]

+\$0 to \$1,365mm

FTA OP 53 Presentation
 NJT ARC RM Talking Points for Entry into FD (PG46 Template)
 Staff Discussion Document and Pre-Decisional Briefing

Schedule Review ...

- TRB G-7 found that average NS project slips 20% of the schedule duration from entry into FD to ROD. ARC is 9 years or 108 months... say 110 months... 20% of that is 22 months.. again say 24 months... with a cost impact of 4-6% of the \$5.5bn base, or \$220mm to \$330mm.
- Program recommendation is that no more than a third (8 months) of that should be available for procurement schedule delay... or a third of that for geotechnical problems...
 - Procurement schedule activities on the critical path (CP), PMO noted that no addenda were planned..
 - Program recommendation is that another 12 months should be factored into the Project CP.... [4 months over the target]
 - PMO(Burns) found 18 months on CP for Manhattan tunnels..
 - Program recommendation is that this should be “factored” another 50% or 9 months... [say a push]...
 - On both a time and cost basis, the forecasts fit within the FTA contingency targets for Entry into FD..
- Schedule issues... (See also above and geotechnical discussion below)
 - Procurement schedules unrealistic ...

D4 Milestone...

- Scope Reviews (Geotechnical Scope findings...)
 - The Geotechnical base work is 11 contract packages inclusive of 3 shafts, NYSPE caverns, tunnels, etc. estimated by NJT in 2007 \$s at \$2.75bn (65% of all hard costs) out of a “hard cost” total of \$4.3bn and \$5.5bn total base year costs (all net of contingency, 2007 \$s).
 - Program recommendation [See March 2008 Geotechnical Risk whitepaper] of 45% - 60% geotechnical risk premium. Based upon NJT RM work to date, recommend using lower bound of 45%. (\$1.2375bn, say \$1,250mm for total geotechnical risk premium)
 - This gives an estimated allocation, equally weighted at \$400mm for Differing Site Conditions (DSC) reserves (No PMO or NJT estimates), \$400mm for PDM/Market risk (PMO (IEI) estimated \$230mm, NJT \$209mm) and \$450mm for geotechnical scope (PMO Burns estimated \$250mm). ***DSC is treated as contingency below, PDM risk is included above and geotechnical scope is in this D4 estimate.***
 - Three geotechnical production functions; (1) TBM rates, (2) shaft excavation and (3) drill and blast for caverns.
 - (1) PMO/Burns found NJT TBM rates to be reasonable, but modified indirects;
 - (2) non-TBM cost estimates to be unrealistic in terms of standby time at 5% and increased to 25% for drill and blast (D&B); “hot rates” on the D&B productions;
 - (3) PMO questioned shaft labor estimates as to adequacy;
 - PMO questioned indirects, contractor contingency and profits and added contingency and their profit; worst case is Hudson tunnel (20% profit, 25% contingency, 25% indirects);
 - PMO (Burns) recommended an 18% increase (\$250mm) on the base budget versus the program target of \$450mm...
 - *Program recommendation is to not accept PMO schedule evaluation pending a more detailed analysis*

[Base year 2007 \$s] **+\$250mm - \$450mm**
 Allocate \$125mm each to SCC10 and SCC20

Page Summary:[2007\$s, no mitigation scenarios]

+\$250mm - \$450mm

August 26, 2008

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- **Systems and Vehicles:** based upon PMO (IEI) analysis, currency escalation (Euros to \$) basis for adjustment... [Base year 2007 \$] **+\$0 - \$ 40mm**
- **SCC70 Real Estate,[IEI recommendation]** [Base year 2007 \$] **+\$70mm - \$150mm**
 Allocate \$70mm to SCC60
- **SCC 80/ force account costs...**
 - Amtrak on NEC, etc. NYCMTA ESA budgeted their Amtrak force account work at 0.6% at FFGA and rebudgeted it to ~3% recently. ARC is currently budgeting force account at \$200mm or 3.5%.
 No Recommendation to add.
 - *Program recommendation is FTA historical experience (HRT study in 2004) that FD cost is approximately 9.7% of associated hard costs...* Hard costs of \$4.3bn plus \$250-400mm (2007\$), \$4.55bn to \$4.7bn...and using 9.7% gives \$440mm to \$455mm.
 - NJT has budgeted \$137mm, variance of \$303mm to \$318mm.
 - No PMO recommendation, program experience only...
 [Base year 2007\$] **+\$0 - \$300mm**

Page Four Summary: [2007 \$s, no mitigation scenarios] **+\$ 70mm - \$ 490mm**
Page Three Summary: [2007 \$s, no mitigation scenarios] **+\$250mm - \$ 450mm**
Page Two Summary: [2007 \$s, no mitigation scenarios] **+\$0 - \$1,365mm**
Grand Total of Base Adjustments: [2007 \$s] **+\$320mm - \$2,305mm**

FTA OP 53 Presentation
 NJT ARC RM Talking Points for Entry into FD (PG46 Template)
 Staff Discussion Document and Pre-Decisional Briefing

Grand total of Base Adjustments: [2007 \$s] +\$320mm - \$2,305mm

Based upon the above recommended adjustments, the existing base cost, net of contingency and finance costs of \$5.5bn could increase anywhere from \$0.3bn to \$2.3bn, or increase to \$5.8bn to \$7.8bn in base year costs (2007 \$s) net of contingency. Using the PMO recommendations as the for basis for adjustments to the lower ranges only, these adjustments were allocated to the following SCCs..

SCC10: +\$0mm (PDM)	+\$125mm (Geotechnical Scope)	Total Adjustment:\$125mm
SCC20: +\$0mm (PDM)	+\$125mm (Geotechnical Scope)	Total Adjustment:\$125mm
SCC30: [no adjustment]		
SCC40: [no adjustment]		
SCC50: [no adjustment]		
SCC60: +\$70mm (Real Estate)		Total Adjustment:\$ 70mm
SCC70: [no adjustment]		
SCC80: [no adjustment]		
Grand Total for Adjustments (Base Year 2007\$s)		\$320mm

Revised Base recommendation for NJT ARC, net of contingency, 2007\$s \$5.8bn vs. \$5.5bn (grantee)

Risk Range for Base with recommendations, net of contingency, \$2007\$s \$5.8bn to \$7.8bn

NJT ARC RM Talking Points for Entry into FD (PG46 Template)
Staff Discussion Document and Pre-Decisional Briefing

D4 Milestone...

Cost Reviews (Continued)

- o Escalation findings... NJT used an escalation rate of 3% in their January 2008 SCC workbook. At the July 31, 2008 debriefing the grantee proposed raising this escalation rate to 3.14%
- o PMO(IEI) recommended going from Grantee's current forecast of 3.14% to 4.25% on the project.
- o Programmatic recommendation was to recognize escalation in 2008 and 2009 which has been higher.
 - Grantee's current YOES adjustment factor using 3.0% in the SCC workbook [January 2008], was 1.1441. With a base year cost of \$5.5bn, this gave a YOES estimate of \$6,295mm (again, net of all contingency). This gives a YOES adjustment of \$793mm, **say \$795mm** as the starting point for this analysis.

[YOES Adjustment] **+\$795mm - \$ 795mm**
 - Using grantee's proposed 3.14% on the \$5.5 gives a YOES adjustment factor of 1.1512. With a base year cost of \$5.5bn, this gave a YOES estimate of \$6,335mm (net of contingency), an increase of \$40mm in the YOESs.

[YOES Adjustment] **+\$40mm - \$ 40mm**
 - With the adjustments (**\$320mm**) to the base year cost as discussed above, using grantee's proposed 3.14% (YOES adjustment factor of 1.1512) increases the YOES adjustment by \$48.5mm, say \$50mm.

[YOES Adjustment] **+\$50mm - \$ 50mm**
 - Adjusting the \$5,820mm (\$5.8bn) base year cost from the grantee's proposed escalation rate of 3.14% (YOES adjustment factor of 1.1512) to 3.8% with YOES adjustment factor of 1.1885 (delta of 0.0373) increases the YOES adjustment by \$217mm, say \$215mm.

[YOES Adjustment] **+\$215mm - \$ 215mm**
 - The marginal cost for the risk (based upon the PMO recommendation to raise escalation rate from 3.8% to 4.25%) is a YOES adjustment factor of 1.222 (delta of 0.0335) and increases the YOES adjustment by \$195mm on the risk range.

[YOES Adjustment] **+\$0 - \$ 195mm**
 - The marginal cost for the risk that 2008/2009 will be a greater inflation rate (say 6%) than 4.25% without offsetting price deflation in the out years is a YOES adjustment factor of 1.2626 (delta of 0.0406) increases the YOES adjustment by \$214mm, say \$215mm on the risk range.

[YOES Adjustment] **+\$0 - \$ 215mm**

Total YOES adjustment on \$5,820mm (2007\$s)

\$1,100mm - \$1,510mm

Total Project Budget: [2007\$s w/adjustments]+ YOES adjustment(s), net of contingency

\$6,920mm - \$7,330mm

Contingency analysis...

- Program recommendation is based upon TCRP G-7 and PG-35 guidelines. PG-35 recommends that without any modification for risk mitigation or risk concentrations, the entry into FD target is 20% contingency calculated on the base cost (not base year \$s) net of contingency and finance.
- Contingencies will be calculated in YOESs only.
- The geotechnical risk premium of 45% discussed above covers cost growth from what is called the PS&E (Plans, specifications and estimate) point where the engineer delivers the estimate. This would normally be equal to the 100% Bid target point. The contingency target for this point is from 10% (PG-35) to 12% (TCRP). The lower PG-35 value is a product of formal risk management programs whereas the TCRP study group did not have such management measures. This 10% target is predicated upon being 100% mitigated with respect to market risk, i.e. fully bid. It has the capacity to “absorb” a forecasted 4% for scope changes and 6% for schedule delays.
 - The question is how much of an “overlap” is there between the geotechnical risk premium and the PG-35 contingency targets? There is some overlap between the two as the differing site conditions claims, almost invariably have a delay component to them. The overlap is not complete, but a 50% assumption seems reasonable. Therefore, the PG-35 target of 10% should be reduced 5% when the geotechnical risk premium is applied to the underlying SCC budget.
- The discussion above looked at the overlap between the PG-35 targets and the geotechnical risk premium beyond the 100% bid point. This project is currently seeking to go into FD. The target at this point is 20%. The difference between the 2 targets (20% versus 10%) is broken down into 2 components: 5% for design changes and 5% for market risk.
 - The question is how much of an overlap is there between the geotechnical risk premium and the PG-35 entry into FD target of 20%? Of the two components, the design change component would have a negligible overlap as it covers design issues on all aspects of the geotechnical scope. The market risk component does in fact overlap the risk premium. Therefore, the PG-35 target of 20% should be reduced 5% when the geotechnical risk premium is applied to the underlying SCC budget.
 - Based upon the two overlap analyses, the entry into FD target of 20% should be reduced 10%, or 10% when the geotechnical risk premium is applied.
- A part of the D4 milestone, it was determined that there was forecasted some \$2.75bn (2007\$s) in geotechnical scope for the project. Using the YOE adjustment factor developed above of 1.263 this becomes \$3.47bn (say \$3.5bn, YOESs).
- Therefore, the total recommendation for Project budget net of contingency at \$6.92bn (YOESs) breaks into two parts, one for the reduced PG-35 target of 10% and one for the application of 20%. The first is \$3.5bn (Geotechnical scope) and \$3.42bn for the rest.
 - The contingency is calculated as follows (1) \$3.5bn(0.1) or \$350mm and (2) \$3.42bn(0.2) or \$685mm for a total of \$1,035mm
- As noted above, the program recommendation for geotechnical risk forecasted \$508mm YOESs, say \$500mm (\$400mm in base year 2007\$s) in differing site conditions. As noted above, this is an after bid contingency. The TCRP and PG-35 targets are not designed to accommodate this type of risk. Therefore, this amount of \$500mm will be added to the \$1,035mm developed above for a total contingency recommendation of \$1,535mm, say \$1.5bn (YOESs).

Adding this contingency recommendation of \$1.5bn (YOESs) to the base of \$6.9bn (YOESs) results in a recommended BCE of \$8.4bn (YOESs) with a contingency % of 22%.

Risk Range for Base with recommendations, net of contingency, \$2007\$s	\$5.8bn to \$7.8bn
Adjusting top range with YOE adjustment and contingency (1.2626 x 1.22 x 7.8)	\$12bn
Revised Risk range for project: YOESs and inclusive of contingency	\$8.4bn to \$12bn

OP40 and OP 53 comparison talking points.....

OP40 and OP 53 comparison talking points.....

OP53 risk model works from an optimistic risk forecast to an increasingly pessimistic risk forecast in a tighter focus than the OP40 model.

OP40 and OP53 both work off of a base. The difference is that the OP40 base is “stripped” of contingency and adjusted to reflect a most optimistic estimate ... OP53 similarly “strips” the contingency but is not further adjusted to develop an optimistic estimate ...

Both models then add back in budget to correct for mechanical errors, inconsistent escalation rates, etc.

For ARC, both the OP40 and OP53 models adjusted NJT’s budget upwards of \$1.2 to 1.4bn in 2009\$, but OP40 first stripped NJT’s budget net of contingency (rev 11) at \$6.894bn another \$0.433 to a net of \$6.461bn before adjustments.

So OP40 produced an adjusted base, net of contingency at \$7.868bn before application of the beta factors. OP53 started with an adjusted base of contingency at \$8.260bn before development of the risk ranges, **a difference of \$392mm!**

OP40 and OP 53 comparison talking points.....

OP53 and OP40 are calibrated models that work of different assumptions and as demonstrated above, bases.

Given that they both predict total cost for the project; they should intersect at some set of mitigation milestones in the OP40 model which forecasts a longer timeline than OP53.

Therefore, OP40 and OP53 should converge from their different bases into **“a zone of agreement”** somewhere in the middle of OP40’s mitigation milestones and then diverge as OP40 continues to forecast mitigation improvement while OP53 is constrained by the FTA past experience to a practical “limit” of mitigation effectiveness.

Restated again, as noted above, OP53 base started almost \$400mm higher than OP40 and then both models converged to congruence in the middle range of the OP40 mitigation milestones and then diverged as OP40 continued to assume improvement of mitigation by the grantee while OP53 was constrained to past experience of realized risk by FTA’s grantees (“the 35 projects”)

OP40 and OP 53 comparison talking points.....

Another striking difference between the two models is that OP40 works from a pessimistic range (witness the entry into PE, entry into FD and FFGA award ranges and how they decrease in OP40) .

For OP53, the reverse is true. Witness the 2008 ARC optimistic ranges going out to the low mitigation capacity. In 2010, OP53 goes from the optimistic in 2010 medium range to the very low range.

Lastly, OP40 works on mitigation milestones and OP53 works on mitigation capacities!

OP40 and OP 53 comparison talking points.....

We are now in a position to overlay the OP53 ranges onto the OP40 mitigation milestones.

The key is to realize that the calculated ranges in the OP40 model are similar to the standard risk severity model in that

The most optimistic risk is at the last mitigation milestone and at the lowest percentile.

The highest or most pessimistic risk is at the earliest milestone and the highest severity for that risk is at the highest percentile for that milestone!

OP40 and OP 53 comparison talking points.....

OP40 and OP53 therefore work in opposite directions. OP40 works in the direction of increasingly effective mitigation while OP53 works in the direction of increasing technical risk AND decreasing management capacity!

For ARC, the PMO developed the following OP40 risk ranges...

PE	10,090,972	12,903,658	15,716,343 [Highest Risk; Largest Severity]
FD	10,070,596	12,870,989	15,671,382
FFGA	10,050,028	12,835,467	15,620,906
40% Bid	9,799,996	11,983,482	14,166,969
20% Construction	9,444,224	10,971,027	12,497,830
50% Construction	9,103,462	9,969,362	10,835,262
75% Construction	8,939,594	9,538,866	10,138,139
90% Construction	8,716,395	8,964,399	9,212,404
	[Lowest Risk; Lowest Severity]		

OP40 and OP 53 comparison talking points.....

Overlaying the OP53 reviews from 2008 gives the following picture:

PE	10,090,972	12,903,658	15,716,343
FD	10,070,596	12,870,989	15,671,382
FFGA	10,050,028	12,835,467	15,620,906
40% Bid	9,799,996	11,983,482	14,166,969
20% Construction	9,444,224	10,971,027	12,497,830
50% Construction	9,103,462	9,969,362	10,835,262
75% Construction	8,939,594	9,538,866	10,138,139
90% Construction	8,716,395	8,964,399	9,212,404

OP53 Very High Mitigation Capacity range in 2008

OP53 High Mitigation Capacity range in 2008 at \$10.1bn

OP53 Medium Mitigation Capacity range in 2008 at \$10.82bn

OP53 Low Mitigation Capacity range in 2008 at \$11.86bn

OP40 and OP 53 comparison talking points.....

Overlaying the OP53 reviews from 2008 and 2010 gives the following picture:

PE	10,090,972	12,903,658	15,716,343	
FD	10,070,596	12,870,989	15,671,382	
FFGA	10,050,028	12,835,467	15,620,906	
40% Bid	9,799,996	11,983,482	14,166,969	<div style="border: 1px solid black; padding: 5px;"> <p>OP53 Very Low Mitigation Capacity range in 2010 at \$13.45bn</p> </div>
20% Construction	9,444,224	10,971,027	12,497,830	
50% Construction	9,103,462	9,969,362	10,835,262	<div style="border: 1px solid black; padding: 5px;"> <p>OP53 Low Mitigation Capacity range in 2008 at \$11.86 and 2010 at 11.96bn</p> </div>
75% Construction	8,939,594	9,518,866	10,138,139	
90% Construction	8,716,395	8,984,399	9,212,404	

<div style="border: 1px solid black; padding: 5px;"> <p>OP53 Very High Mitigation Capacity range in 2008 at \$8.7bn</p> </div>	<div style="border: 1px solid black; padding: 5px;"> <p>OP53 High Mitigation Capacity range in 2008 at \$10.1bn</p> </div>	<div style="border: 1px solid black; padding: 5px;"> <p>OP53 Medium Mitigation Capacity range in 2008 and 2010 at \$10.82bn</p> </div>
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OP40 and OP 53 comparison talking points.....

- To recap, OP53 goes from lowest risk and severity to the highest risk is a somewhat diagonal line.
- If the grantee fails to meet mitigation targets and milestones .. the risk forecast increases and the mitigation ranges in OP53 “shift up” and “over” to the upper right of the OP40 ranges in the earlier mitigation milestones.

OP40 versus OP 53 in support of Programmatic Decisions

- To recap further, as noted above, the two models offer similar views of project risk...
- OP53 offers more visibility into what specific mitigation range the grantee could likely perform to than the OP40.
- In this sense, OP53 supports a more granular picture of project risk and support negotiations with the grantee on finalizing cost and schedule...

OP53 presentation

Part III

**OP53 Prototype used in
2008 to summarize and
communicate cost risks for
the ARC Project**

ARC Cost Risk Summary
Pre-decisional and Confidential document
FTA Internal Only

All \$ are in millions	NJT Capital Cost Estimate January 2008	Very high degree of mitigation	High degree of mitigation	Medium degree of mitigation	Low degree of mitigation	Assumptions	NJT Proposed Estimate August 2008
Construction	4,297	4,547	4,997	5,297	5,647		4,297
<i>Geotechnical Scope</i>	0	150	250	350	450	Production rates for tunnels and caverns, TBM downtime, contractor contingencies	0
<i>Geotechnical Project Delivery</i>	0	100	200	300	400	Single bidder premium, contractor margins/overheads, procurement schedule delays, impacts to other contractors	0
<i>Stakeholder Risk (Amtrak)</i>	0	0	250	350	500	Power distribution, Construction interfaces on the NEC and NYP	0
Professional Services	668	668	818	918	1,118		668
<i>Final Design</i>	0	0	150	200	300	Historical experience on heavy rail	0
<i>Construction Management</i>	0	0	0	50	150	Project is 12 month longer...	0
Real Estate	307	407	407	507	657		379
<i>Commercial Real Estate</i>	0	100	100	100	100	Manhattan RE changes	72
<i>Stakeholder Risk (Amtrak)</i>	0	0	0	100	250	NEC Corridor ROW costs, NYPSE costs, W Manhattan yards...	0
Vehicles	471	471	571	721	851		471
<i>Procurement Risk (Coaches)</i>	0	0	100	200	280	Reprocurement risk, currency risk,	0
<i>Procurement Risk (Locomotives)</i>	0	0	0	50	100	Currency risk, tax risk, performance risk	0
Subtotal: 2007\$s	5,743	6,093	6,793	7,443	8,273		5,815
Escalation	3% 2008 thru 2017	1,352 (1.222) 4.25% 2008 thru 2017	1782(1.2626)	1,955 (1.2626)	2,172 (1.2626)	Columns 3-5, 6% 2008/2009, 4.25% thru 2017	1,096 (1.1885) 3.8% 2008 thru 2017
Total: YOE\$s	6,625	7,445	8,577	9,398	10,445		6,911
Contingency	1,021 (15.4%)	1,655 (22.2%)	1,710 (20%)	1,650 (17.5%)	1,635 (16%)		1,589
<i>Unallocated Contingency</i>	1,021	1,180	1,310	1,450	1,635		568
<i>Differing Site Conditions Reserve (DSC)</i>	0	500	400	200	0	DSC reserves are reduced as geotechnical risk is monetized into the base.	0
Adjusted Total (YOE\$s)	7,646	9,100	10,287	11,048	12,080		8,500

ARC Cost Risk Summary

Pre-decisional and Confidential document

FTA Internal Only

Assumptions:

Differing Site Conditions reserve: Increasingly pessimistic scenario assumes that contractors front end load their pricing.

Notes:

Contingencies are based upon a split of 10% on the geotechnical and 20% on the rest....

For \$7,445 (YOE\$s) ... \$3,500 geotechnical base (plus $(\$250 \times 1.222) = \$3,806 \times .1 = \$380$; \$3,639 other at 20%=\$728, say 730, or \$1,110, say \$1,155 before DSC reserve of \$500, or \$1,655...

For \$8,577 (YOE\$s) ... \$3,500 geotechnical base (plus $\$450 \times 1.2626 = \$4,068 \times .1 = \$407$, say \$410; \$4,509 other at 20%=\$902, say \$900 or \$1,310 before a reduced DSC reserve of \$400, or \$1,710...

For \$9,398 (YOE\$s) ... \$3,500 geotechnical base (plus $\$650 \times 1.2626 = \$4,320 \times .1 = \$432$, say 430; \$5,078 other at 20%=\$1,015, or \$1,445, say \$1,450 before a reduced DSC reserve of \$200, or \$1,650...

For \$10,445 (YOE\$s) ... \$3,500 geotechnical base (plus $\$850 \times 1.2626 = \$4,575 \times .1 = \$457$, say \$460; \$5,870 other at 20%=\$1,175, or \$1,635 with no DSC reserve (\$0), or \$1,635

R3: September 3, 2008

OP53 presentation

Part IV

**Using Risk data from the
2008 OP53 Prototype
management capacities and
mitigation strategies were
developed for the ARC
Project. (i.e the Project
Execution Plan, or PEP)**

Project Execution Plan (PEP)
for the New Jersey Transit (NJT) Access to the Region's Core (ARC) Project
January 16, 2009 Final

A. Purpose

This document reflects the Project Execution Plan (PEP) and resultant Project Execution Strategy agreed to between the Federal Transit Administration (FTA) and New Jersey Transit (NJT) for managing the risk associated with implementing the Access to the Region's Core (ARC) Project proposed for funding from the Section 5309 New Starts program. The PEP establishes a framework for effectively and efficiently managing risk throughout project implementation, while relying on NJT's technical capacity and capability (TCC) as the mechanism for assuring that those implementation actions can and will be met. The PEP identifies the tools that NJT will use to manage and that FTA will use to monitor NJT's implementation of the project and identifies areas where the PEP will be updated based on knowledge gained through final design and early construction activities.

The primary goal of the PEP is to identify mitigation tools designed to provide the greatest level of assurance that the ARC Project can proceed through the final design and construction phases and be delivered to the start up phase on budget and on schedule. This document is based on a baseline cost estimate (BCE) of \$8.701 billion (B) as of January 13, 2009 in year of expenditure dollars (YOES), for the project that will be placed into service on the Revenue Operations Date (ROD), with a total contingency level of \$1.884 B in YOES, and a schedule contingency of 5 months on the critical path, with a Revenue Operations Date (ROD) of December 2017. The current baseline schedule is Master Project Schedule (MPS) Rev 3, updated as of December 2008.

The means of implementing the principles embodied in this document will be through the integration of the PEP requirements into the ARC PMP and the flow down of such requirements and scope in a traceable manner into third party contracts in the form of identifiable inputs and outputs (deliverables) that are fully integrated and coordinated between third party scopes such as the design and construction management contracts. This integration may require additions/changes to the ARC Project Management Plan ("PMP"), which is required by statute and described in FTA Circular 5010, and will be supported by the development of separate sub-plans for Quality, Cost, Schedule, Risk, Cost and Schedule Contingency, Secondary Cost and Schedule Mitigation Capacity, and Geotechnical Management Plans that articulate the processes and procedures that NJT will use to demonstrate conformance with these PEP requirements, in addition to management subplans required by FTA, such as for Real Estate Acquisition Management Plan (RAMP), Rail Fleet Management Plan (RFMP), Safety and Security Management Plan (SSMP), etc. The overall purpose and essential components of each of these sub-plans are described in detail below.

The requirements listed in this document are not exhaustive in describing all of the requirements that NJT must meet in order to establish technical capacity and capability or to prepare project management plans under other FTA documents such as, but not limited to, FTA circulars, directives, and the Full Funding Grant Agreement including the master agreement. As part of the requirement for an acceptable PMP, NJT shall implement and maintain throughout the project, a formal PMP/sub-plan revision process that accurately reflects the NJT organizational structure needed to meet FTA's Technical Capacity and Capability (TCC) requirements as well as any changes that may be needed to reflect additional requirements to the organization or the sub-plans as the project moves from final design through construction.

NJT acknowledges that ongoing, satisfactory conformance with the PEP, within the implementation timeframes established in this document and the PMP, is key to future FTA programmatic decisions (issuance of Letters of No Prejudice and/or an Early Systems Work Agreement, execution of a Full Funding Grant Agreement, approval of required recovery plans, and on-going determinations that NJT continues to possess the TCC to carry out the ARC project).

Candidate revisions or improvements to NJT's PMP will be identified through various means, tracked and reported as part of the quarterly project review process, and should include but not be limited to process-improvement proposals, measurements of the processes, lessons learned in implementing the processes, and results of process appraisal and deliverable evaluation activities.

In order to accomplish the risk and contingency management goals identified by this PEP, the following strategies, described in detail below in the appropriate management sub-plan, will be employed:

- Establishment of risk baselines and mitigation framework and milestones, based on cost estimates, cost forecasts and project schedule planning, all of which will be updated quarterly.
- Minimum Cost and Schedule contingency curves and cost and schedule risk management capacity, developed and implemented as needed to achieve targets.
- Secondary Cost Mitigation Strategies, developed and implemented as necessary to offset cost contingency drawdown inside the Cost Mitigation Buffer Zone.
- Secondary Schedule Mitigation Strategies, developed and implemented to offset critical path or near critical path activity schedule slippage and other requirements.
- Geotechnical and Utility risk mitigation strategies.

In addition, NJT will have in place an organization structure that ensures that the:

- Project Executive Management structure defined in NJT's PMP is supported by management processes which evaluate respective issues and provide documented recommendations for decision-making.
- Primary responsibility for validating cost estimates, contract packaging, general provisions, project schedules, and risk management efforts that is separate from and organizationally independent of the design contractor's organization.

- A functioning system of adequate internal controls is maintained and regularly and independently tested, to ensure (1) the allocation of project level work scope and related budget to contract packages, (2) the reallocation of scope and related budget between contract packages using a suspense account for unassigned project scope elements until a new contract package is identified, and a double entry system; (3) that project definition and contract package development proceeds in conformance with documented NJT business objectives, management plans and directives and (4) the management of contingencies.
- A clearly defined “chain of command” as defined in the PMP with senior level NJT managers having primary responsibility for implementing the PEP and maintaining conformance and responsibility for project schedule, incentives, and recovery strategies.
- Stakeholder comments and directives are channeled thru NJT’s configuration control procedures.

B. Letters of No Prejudice (LONP) and/or Early System Work Agreement (ESWA)

Because many of the mitigation activities described in this document must be reflected in the early construction contracts, which NJT plans to advertise in the next three to six months, NJT will ensure that the processes outlined in this PEP are being followed and PMP revisions are being implemented. NJT may proceed with the prequalification of bidders in conformance with its procedures in advance of a FTA LONP or an ESWA. NJT will also ensure that when it requests technical proposals from prequalified bidders or requests sealed bids it must provide FTA with supporting documentation in advance that demonstrates the procurement process has been in conformance with the PEP with respect to the individual contract. NJT may request these technical proposals or sealed bids in advance of a FTA LONP or an ESWA. However, FTA will not issue a LONP or an ESWA until the contract is ready for an award and NJT has demonstrated continued conformance with the PEP with respect to that contract.

C. NJT’s Roles and Responsibilities

In order to implement this PEP, NJT will be responsible for developing and implementing the following requirements for these referenced sub-plans as part of the PMP.

1. Quality Management Plan

The Project Quality Management System (QMS) ensures that all the necessary programs are established and closely followed. The following additional requirements will apply to the Project QMS:


- Objectives for the Project QMS that include a control program for Project Controls (inclusive of cost and schedule) similar in nature to that for Design and Construction.
- Deliverable Quality Plans (DQPs) that define the relevant project controls, processes, interfaces, critical delivery activities and responsibilities in respect to each deliverable for specific tasks including at a minimum, geotechnical, cost, schedule and procurement documents.
- Quarterly QMS reports that track the use of controls and consistent implementation of processes as well as conformance with documented NJT business objectives, management plans and directives and contract documents.

2. Cost Management Plan

NJT will implement and maintain a cost management plan (inclusive of related procedures) that will provide reliable cost information and meet the following requirements:

- Design and Construction Management contractor scopes of work, inclusive of products, plans and procedures, that are consistent with this overlying cost management plan;
- NJT's approach to achieve a "design to budget" capability for the NYPSE Fit-out and the Project Wide Railroad Systems contracts will be separate from the typical estimate updates at design review milestones (60%, 90% and 100%). Major components of the NYPSE Fit-out which will include such items as mechanical, electrical, plumbing and vertical circulation, and Project Wide Railroad Systems such as Traction Power, Signals, Communications and CCTV will be developed early in the Final Design phase by specific units and listed on material registers, tabulated by major component and compared to component costs defined in the PE cost estimate. Where component budgets significantly vary from established budgets, an assessment will be made to determine necessary revisions to the design to maintain the overall budgets established for both NYPSE Finishes and Project Wide Railroad Systems contracts. This iterative "design to budget" process will continue through out the progression of the NYPSE Fit-out and Project Wide Railroad Systems design.
- Cost estimates will have basis documentation;
- Analysis of individual contract package cost estimates is included as part of the Monthly Report and is based on documentation; and
- Current overall project cost estimate is maintained. At a minimum, a revised project cost estimate will be delivered 1) using the then current year as the base year no more than 90 calendar days prior to the submission of the FFGA application and 2) a new base year update (again using the then current year as a base year) no later than 24 months after FFGA execution, or at 50% (of the dollar value) bid, whichever is earlier.

3. Schedule Management Plan

NJT will develop and implement a schedule management plan (inclusive of related procedures) that will provide reliable schedule information and meet the following requirements: 

- Design and Construction Management contractor scopes of work, inclusive of products, plans and procedures, are consistent with this overlying schedule management plan;
- The project schedule for major activities, using forecast data resulting from progress curves, is applied to critical path activities and the next longest path, is analyzed and included as part of the Monthly Report and is based on documentation;
- A current Integrated Project Schedule is maintained. At a minimum, a revised Integrated Project Schedule will be delivered 1) no more than 90 calendar days prior to the submission of the FFGA application, and 2) no more than 24 months after FFGA execution, or at 50% (of the dollar value) bid, whichever is earlier.

4. Risk Management Plan

NJT will develop and implement a risk management plan that will include the specifics on what is to be done, along with the associated cost and schedule, when it should be accomplished, who has organizational responsibility, how the most appropriate risk management strategy will be selected, and how and when its effectiveness will be measured or tested in order to:

- a. Assess (identify and analyze) project cost and schedule risk;
- b. Develop risk-handling options inclusive of primary risk mitigation;
- c. Develop a secondary mitigation plan and related capacity to handle risk events or "triggered" mitigation activities and as appropriate, their recapture;
- d. Monitor risk mitigation to determine how risks have been handled or changed; and
- e. Document and report the results of the risk management program.

The Risk Management Plan will provide a formal, systematic approach (inclusive of related procedures) for the management of project cost and schedule against a baseline by undertaking specific tasks and outcomes based on the following:

- Enumerative lists of project risks ("risk lists" or "risk registers") in the form of summed random variables, iteratively advanced in both mean and variance to meet 1) a model specification set forth in the approved risk management plan and 2) characterized using a risk classification structure and mitigation sequence similar to that used by FTA;
- A Risk Mitigation Framework that presents specific risk mitigation/transfer/sharing efforts to reduce the perceived risks and potential variability of costs through each of the ARC project milestones ("mitigation milestone") by providing the structure for the organization to maintain its focus upon these risk mitigation/transfer/sharing efforts and avoid the potential impacts from these identified project risks; and
- Mitigation Milestones that address:
 - The basis for project risk status forecast using the risk classification structure and mitigation sequence discussed above, defined in terms of physical completion of sealed bid procurement actions for construction ("Bid") and the construction contract completion itself ("Constructed"); and
 - Measurable mitigation objectives based on model based simulations of implementation (expected outcomes achieved) of all identified mitigation activities/deliverables at each of the milestones as well as the value of expected mitigation at this milestone measured by comparing the change in values forecasted by model at this versus the previous milestone.

5. Cost Contingency Management Plan

NJT will develop and implement a cost contingency management plan that ensures there is sufficient contingency available at key milestones for completion of the project and that distribution, or consumption of total contingency, whether in the form of reservations or encumbrances is subject to certain restrictions and requirements in order to achieve this purpose. For purposes of managing contingency, the amount of total contingency is segregated into Contingency, those funds that are readily and freely available to absorb cost increases to

the Project, and Project Reserve, those funds that are available for distribution to the project budget following a formal review process.

Part of the basis for establishing the Project Reserve amount is to ensure that sufficient funds are available at various milestones to provide funds for geotechnical risk inclusive of preaward and post award amounts. As of January 14, 2009, this geotechnical reserve portion of the project reserve is funded with a total of \$400 million. The geotechnical reserve funds must remain in the Project Reserve during project implementation in accordance with the geotechnical risk amounts identified in Exhibit 1. This fund is subject to FTA review and concurrence.

An additional basis for establishing the Project Reserve is to ensure that sufficient funds are available for other unexpected and unanticipated costs resulting from changed stakeholder and operator requirements or scope additions. This is a complimentary portion of the project reserve to the geotechnical risk portion identified above. Releases of this portion of project reserve funds may only be accomplished to the extent that the geotechnical risk minimum balances are maintained.

Taken together, the geotechnical risk portion and its complimentary must remain at or above the minimums set forth below and on Exhibit 1. with release of the Reserve managed and controlled as provided for in this PEP.

The plan provides for a detailed definition of what constitutes total contingency, project reserve, its geotechnical risk and complimentary portions, including identifying the amount of contingency, project reserve, geotechnical risk and complimentary portions needed at certain milestones, and the process for distributing the contingency and project reserve portions.

The Cost Contingency Management Plan, inclusive of procedures, will address the following requirements:

- include a detailed definition of the total contingency associated with undefined and as-yet unknown requirements, expressed either as an absolute dollar amount or as a percentage reflecting the ratio of the aggregate of allocated and unallocated cost contingency in all its forms, net of financing and any allowances associated with known but undefined requirements;
- describe the manner in which NJT will forecast and trend the project contingency, as part of its overall budget and progress reporting effort, including reflecting
 - transactions that are sufficiently documented in a timely manner with no double bookkeeping or retroactive accounting actions;
 - contingency replenishment that is created by means of construction bids lower than estimated, contract underruns, value engineering; and/or
 - secondary mitigation which is transferred back to the appropriate contingency account in a timely manner, and identified as part of total contingency ;

- ensure that the amount of the Geotechnical risk portion of the Project Reserve will be above the following minimum amounts, at the specified times, also known as " Milestone Review Points", which are defined in terms of physical completion of sealed bid procurement actions for construction ("Bid") and the construction contract completion itself ("Constructed") and that distribution and use of these amounts is managed in conformance with this PEP.
 - \$400 million through Q4 2011; thereafter
 - \$150 million through Q4 2013; thereafter
 - \$50 million through Q4 2017.
- ensure that the amount of Project Reserve inclusive of its geotechnical risk and complimentary portions will be above the following minimum amounts, at the specified times, also known as "Milestone Review Points", which are defined in terms of physical completion of sealed bid procurement actions for construction ("Bid") and the construction contract completion itself ("Constructed") and that distribution and use of these amounts is managed in conformance with this PEP.
 - \$1,000 million through 50% bid, currently forecasted at Q3 2010; thereafter
 - \$800 million through Q1 2012; thereafter
 - \$600 million through the Q1 2013;thereafter
 - \$400 million through Q4 2013;thereafter
 - \$200 million through Q3 2014;thereafter
 - \$100 million through Q4 2017.
- establish the following Minimum Contingency thresholds inclusive of their Project Reserve portions, as identified in the cost contingency graphic incorporated into the PEP as Exhibit 1 (current forecast information is based initially on the Master Project Schedule (MPS) Rev 3, updated December 2008. As the MPS is revised and updated throughout the life of the program, the time periods may shift):
 - From \$1,400 million in Q1 2009 to \$1,200 million at 75% bid, currently forecasted at Q4 2011, in a straight line slope between the two points.
 - From the above \$1,200 million in Q4 2011 to \$1,000 million 90% Bid, currently forecasted at Q4 2012, in a straight line slope between the two points.
 - From the above \$1,000 million in Q4 2012 to \$100 million in Q1 2015, in a straight line slope between the two points; thereafter
 - \$100 million thru Q4 2017.
- ensure that distributions of project contingency above project reserve minimums are appropriately controlled and result from deliberate and sufficiently independent NJT Management actions with adequate internal controls that are tested regularly and through independent agency audits;
- ensure that distributions of the geotechnical risk portion of the project reserve are appropriately controlled and subject to formal deliberations and approval by the project's Executive Steering Committee in accordance with this PEP, the interagency MOU, and as described in the PMP. The Executive Committee will assess the reason for using the Project Reserve and the project implications of such use. Distributions of such geotechnical

risk funds for purposes other than for explicitly geotechnical risk purposes shall be subject to FTA Region II review and concurrence.

- ensure that distributions of the complimentary portion of the Project Reserve are appropriately controlled and subject to formal deliberations and approval by the project's Executive Steering Committee in accordance with the interagency MOU, and as described in the PMP. The Executive Committee will assess the reason for using the Project Reserve and the project implications of such use.
- Report within 30 days to the Boards of Directors of NJT and the Port Authority (or their subcommittees), regarding distributions of project reserve.
- if during project implementation either the minimum contingency or Project Reserve, or the geotechnical risk portion balances do not meet the minimum requirements of this PEP, efforts to develop and implement a recovery plan will immediately be initiated in a manner acceptable to FTA, and NJT will advise FTA of any such use.

Schedule Contingency Management

FTA and NJT agree that in order to ensure sufficient schedule contingency for completion of the project, distribution, or consumption of schedule contingency, NJT will:

- manage the distribution, transfer and use of all project schedule contingency in conformance with this PEP.
- control the distribution of all project schedule contingency through independent management action with adequate internal controls that are tested regularly and all related actions are documented in a timely manner.
- ensure that schedule contingency that is created by means of shortened critical path activities such as "work arounds" that realigned activities and increased float is transferred back to the appropriate schedule contingency account in a timely manner, and identified as part of total schedule contingency.
- describe the manner in which NJT will forecast and trend the Project Schedule contingency, as part of its overall progress reporting effort.
- ensure that the amount of schedule contingency throughout project implementation, which is defined in terms of physical completion of procurement actions for construction and the construction contract completion itself ("Constructed"), and the critical path float for the project schedule, will at all times be above the minimums set forth in Exhibit 2, which will be updated as the project moves through final design, and which currently contains the following time periods :
 - 150 calendar days through the Award of Contract C12 – Manhattan Tunnels. Currently, this is forecasted to occur during the 4th quarter of 2009.
 - 30 calendar days as the minimum differences between the project critical path and the next longest path(s) (namely "near critical" paths).

- prior to execution of the FFGA, a more comprehensive and final project schedule will be delivered. NJT will also develop and implement a schedule contingency management plan that will indicate the contingency structure and specific contingency components, such as physical configuration of the project critical path, minimum float (schedule contingency in the form of project interface float) between the project critical path and listed near critical events such as Real Estate acquisition, procurement NTPs. Contingency data will be integrated into this PEP and a graphic depicting schedule contingency drawdown will be developed and inserted into this PEP as the planned for exhibit 2.

If during project implementation, schedule contingency management does not meet the above minimum requirements, efforts to develop and implement a recovery plan will immediately be initiated.

6. Secondary Cost Mitigation Capacity

Separate and above the mitigation scope required by NJT's primary mitigation effort, NJT will also develop a secondary mitigation plan and related capacity to handle risk events or "triggered" mitigation activities that are project phase specific. These activities arise when events occur that may include, but are not limited to, required scope changes, cost overruns, unforeseen site conditions and outside agency and force account cost and schedule impacts. NJT's capacity to effectuate secondary mitigation will be as follows:

New Jersey Transit has identified numerous secondary mitigation items and the cost saving opportunities associated with these secondary mitigation items have already been exercised. NJT continues to explore opportunities to reduce cost while delivering the ARC Project scope on time and within budget. Cost saving opportunities, when identified, will be exercised as early as possible in the design process to ensure that the option is preserved in the construction phase.

Since most of the secondary mitigation capacity has already been utilized, a significant amount of secondary cost mitigation capacity is no longer available to NJT for this PEP. Instead NJT will elevate the issue to higher level management involvement when it is determined that secondary cost mitigation measures are needed. The specifics and details of this management escalation will be established in the PMP and the Cost Contingency Management Plan. At a minimum, it will provide for reporting to the Executive Committee when secondary mitigation efforts are required. The Executive committee will report to the Boards of Directors of NJT and the Port Authority (or their subcommittees) on a monthly basis when secondary cost mitigation efforts are required beyond 180 calendar days.

NJT will continue to make a "best effort" to identify further secondary cost mitigation opportunities and use good judgment in deciding on the use of such opportunities to maintain the cost contingency balance above the minimum. NJT will report to FTA once it has determined whether any of the following opportunities are to be included as secondary cost mitigation strategies and how and when they would be executed:

- Reduction in various traction power supply components from that required in 2030 to that in 2017;
- Reduction in Kearny yard capacity and functionality for the same time period;

- Reduction in station size and tracks, capacity at FRL such that the east end facility expansion is not required.

7. Secondary Schedule Mitigation Capacity

Separate and above the mitigation scope required by NJT's primary schedule mitigation effort, NJT develop and maintain a capacity to effectuate secondary schedule mitigation through the development of an aggregate minimum capacity of 165 calendar days of schedule compression for the critical path of the project.

8. Geotechnical Risk Mitigation Capacity

Separate and above the required cost and schedule mitigation scopes (primary and secondary), NJT will also develop a geotechnical risk capacity and geotechnical mitigation capacity strategy, based upon NJT's contract packaging strategy as of [Rev 4, May 2008], that will effectuate primary geotechnical risk mitigation as follows:

a. Project Level Strategies:

Recognizing that determination of the details of subsurface conditions is more important to reducing the total cost of geotechnical scope than any other detail of design; NJT will implement systemic methods for establishing ground conditions adjacent to and between its explorations.

With respect to contracts with geotechnical scope, NJT will ensure that some level of risk allocation is achieved by means of explicit contract language, supplementary provisions, and the presence of recognizable financial consideration. NJT will make use of Geotechnical Baseline Reports in this regard.

Such risk identification will be for discrete, identifiable items that are capable of being arbitrated between NJT and the contractor and which NJT estimates that the contractor can manage the risk more efficiently. For the design build contracts, NJT will seek potential contractors' understanding of geotechnical risk and their technical solutions in order to mitigate these risks during the procurement process.

Recognizable financial consideration for geotechnical scope items may be in the form of provisional sums, allowances, incentives, award fees, unit pricing or other approaches. Project savings may be shared or not shared with the contractor based upon NJT's analysis.

b. Contract Package Level Strategies:

The Geotechnical Program Plan (GPP) is the primary management sub-plan under the PMP and it is the parent document to all underlying geotechnical, environmental site, groundwater hydrology reports. This Plan will be phase specific, and updated as necessary to reflect current conditions within the phase of the project.

The GPP will describe NJT's development and implementation of underlying contract specific sub-plans consisting of as a minimum; exploration plans, data reports (such as GDRs), interpretative reports (such as GIRs) and design memoranda (GDMs), allocation documents (such as Geotechnical Contracts Risk Allocation Plan, Source Selection Plans for selected contracts), control documents (such as PWBS/CWBS, estimates, progress functions) and contract documents (such as General Provisions, Technical Provisions, Contract Deliverable Requirements List (CDRLs), specification sections (Division 1) and as applicable, Geotechnical Baseline Reports (GBRs)). The GPP, or its contract specific sub-plans will be updated thru FD phase project implementation using gap analysis of exploration data and data analysis techniques.

All Geotechnical Design Memoranda (GDMs), or other design memoranda as applicable, will contain separate construction considerations sections that address all significant scope items. These GDM construction considerations sections will be independently reviewed by project construction managers, estimators and schedulers as well as subjected to periodic, formal constructability reviews.

GDM construction considerations information and other GDM information as appropriate will then be integrated into a contract specific Geotechnical Construction Plan (GCP) which will summarize all geotechnical requirements and provisions including but not limited to contractor design and exploration scope, materials handling requirements, dewatering requirements, systems, and logistics.

The GCP is a parent document to the following contract specific deliverables: contract work breakdown structure (CWBS), contract deliverable requirements list (CDRL), Geotechnical Risk Allocation Plan (G-RAP) and contract specific configuration management report.

A contract specific Geotechnical Risk Allocation Plan (GRAP) will disaggregate project level and package specific interpretative materials, the contract specific GCP and its sub-products (CWBS, CDRL), so as to clearly identify contingent scope in these deliverables. The primary function of the GRAP is to identify and allocate that contingent scope to one of the following: fully allocable to specific budget lines, fully allocable to specific allocated contingency lines, or partially allocable to specific budget and partially allocable to specific allocated contingency. A secondary function is to classify this contingent scope using NJT's risk management plan and mitigation structure to identify potential third party transfers, evaluate the economics of that transfer and establish trade off ranges for such transfer. NJT will formally document its analyses and rationale for application of this risk compensation in the GRAP which provides the basis for NJT's business decision of how to allocate or retain geotechnical risk between itself and the contractor.

NJT will develop specific contract packages in conformance with the process flow charts that are attached to this PEP as Exhibit 3. A critical element of this process is NJT's ability to maintain management control of the process, deliverables and review points as defined in the graphics as well as to internally validate key construction and business deliverables. Internal validation is the process whereby contractor products, including at a minimum those identified in Exhibit B3, are independently reviewed and analyzed using scoped deliverables that adequately communicate NJT's expectations to the independent contractor on the review and which NJT has determined are sufficiently resourced with qualified personnel.

Source selection plans will be developed for geotechnical contract packages that contain project critical path activities, significant technical risk, or are above \$100 million. Such plans will be consistent with and extend the risk allocation planning in the parent GRAP document. These plans will identify a process for establishing transfer of specific risks and associated financial resources.

D. Project Execution Strategy

The major goal of the project execution strategy is to use the above referenced mitigation and contingency strategies, and relevant sub-plans, in tandem. The primary strategy is to maintain a total contingency balance throughout the life of the project that is acceptable to both NJT and FTA, which is determined to be sufficient to complete the Federal project at various milestones. The secondary strategy recognizes that there is a "break point" in project execution where all market risk and early construction risk has been mitigated, beyond which the application of contingency is the only effective way to treat project risk. Prior to this break point, risk mitigation often is required to preserve the agreed upon minimum contingency balances. NJT may apply contingency, without mitigation, in those circumstances where such contingency is sufficient. This requires the integration of NJT's risk management and contingency management activities and the creation of a secondary mitigation "buffer zone" above the minimum contingency balances identified in the cost contingency graphic (Exhibit 1). This strategy also recognizes that NJT's management of the project may create additional (new) contingency or preserve sufficient existing contingency to allow "recapture" of earlier, secondary mitigation efforts.

FTA and NJT agree that risk mitigation activities need to be coordinated with contingency activities. As part of the ongoing project management process, specifically, the annual update and FTA review and approval of NJT's PMP, the Project Execution Graphics (inclusive of cost Exhibit 1 and schedule contingency planned as Exhibit 2) attached to this PEP will be adjusted up or down to reflect the current cost and schedule status and NJT's past performance as well as demonstrate conformance with the agreed upon Contingency, Project Reserve and Geotechnical Risk portion minimums.

NJT will coordinate its Risk Management Plan and activities with its Cost Contingency Management Plan and activities in order to ensure that the Cost Contingency, Project Reserve and Geotechnical Risk portion minimums are preserved throughout the duration of the project. NJT will also integrate such plans and activities through the creation of a secondary mitigation "buffer zone" and related "recapture" opportunities (if applicable) as described below.

To accomplish this, a secondary mitigation buffer zone will be established and maintained at approximately 20% above the associated undistributed contingency minimum, as defined

below and by example in the attached Exhibits 1 and planned for Exhibit 2. NJT requirements for contingency (cost or schedule) where the balance is greater than the associated buffer zone boundary may be satisfied by the application of either contingency, secondary mitigation or some combination thereof. This discretion to choose either contingency or secondary mitigation continues up to the point where the balance goes inside the buffer zone.

In those instances where the contingency balance is within the buffer zone, NJT will satisfy requirements for contingency along with the escalation of management involvement, review and reporting requirements as described in this PEP, the PMP and the Contingency Management Plan.

In order to manage the contingency drawdown, NJT will:

- Report, as part of the FTA Quarterly Progress Review (QPR) meetings, on the level of available contingency as compared with the predicted level on the minimum contingency balance curve, including current and forecasted trend analysis of all contingency elements;
- Review with the PMOC, at each Milestone Review Point, the Risk and Contingency Management Plans and Risk Mitigation Framework to examine potential risks remaining and to update Exhibits 1 and planned for Exhibit 2; and
- Review, as part of an overall budget control process, the cost for individual construction contracts at each design deliverable (60%, 90% and 100%) to see how the most current estimates compare with budget values.

E. FTA Roles and Responsibilities

FTA's role is to provide oversight of NJT's efforts to mitigate the risks identified with the ARC project and to determine that NJT at all times has the statutorily required legal, technical and financial capacity and capability to carry out the project, consistent with established FTA requirements. It does this through on-goings reviews of NJT's implementation of the PEP, by identifying areas of concern, and by seeking action from NJT to remedy an identified area of concern.

To this end, FTA and its PMOC will monitor and evaluate NJT's implementation of the individual PMP sub-plans as well as the overall project execution strategy for the ARC project as well as the effectiveness of its integration of risk and contingency mitigation activities in conformance with the requirements of this PEP and if applicable, any awarded FFGA. As part of this responsibility FTA will conduct joint reviews with NJT at the end of specified milestones, to evaluate among other matters, the project implementation with respect to the required sub-plans.

Exhibit 1

Exhibit 1 Total Cost Contingency Drawdown (\$YOE)

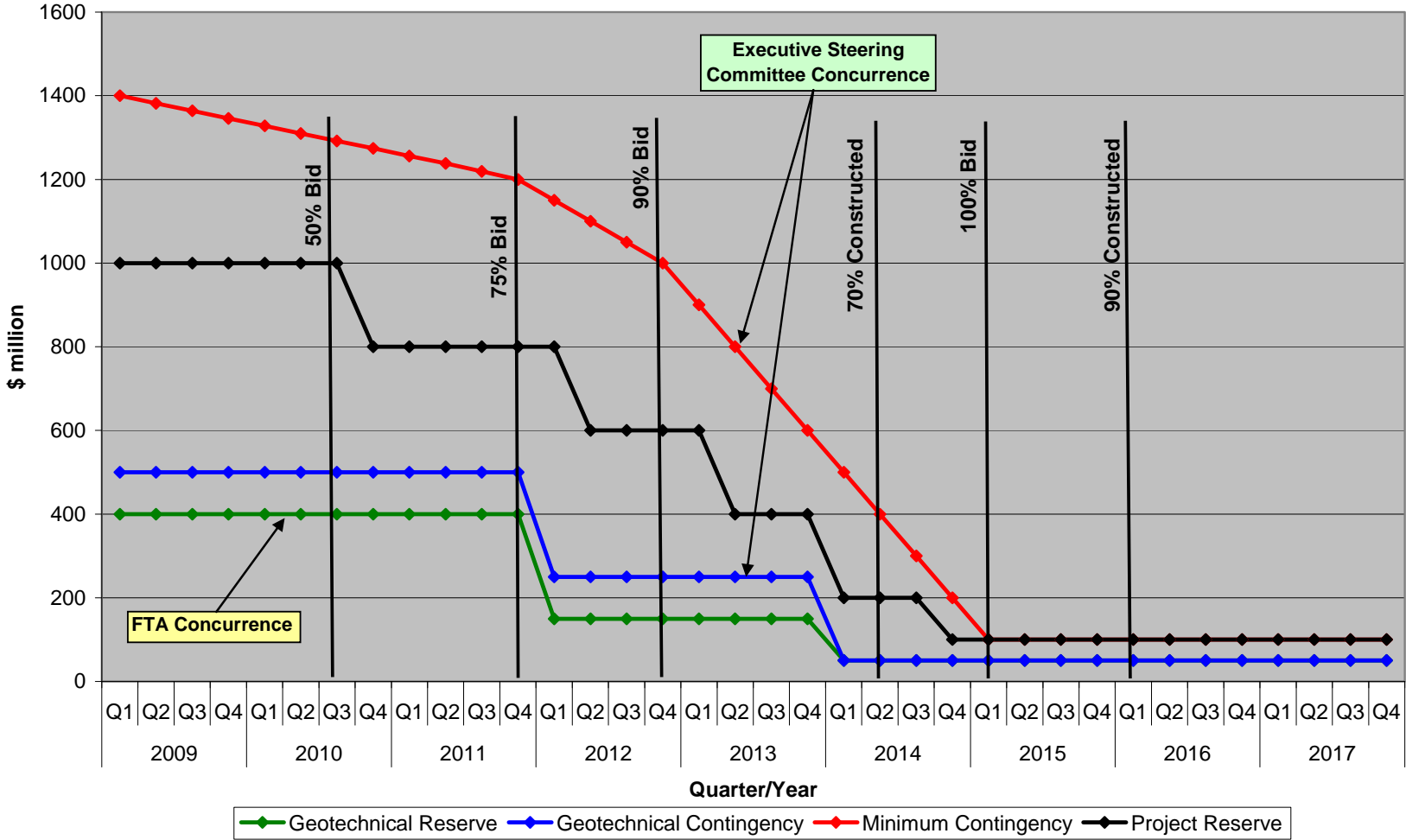


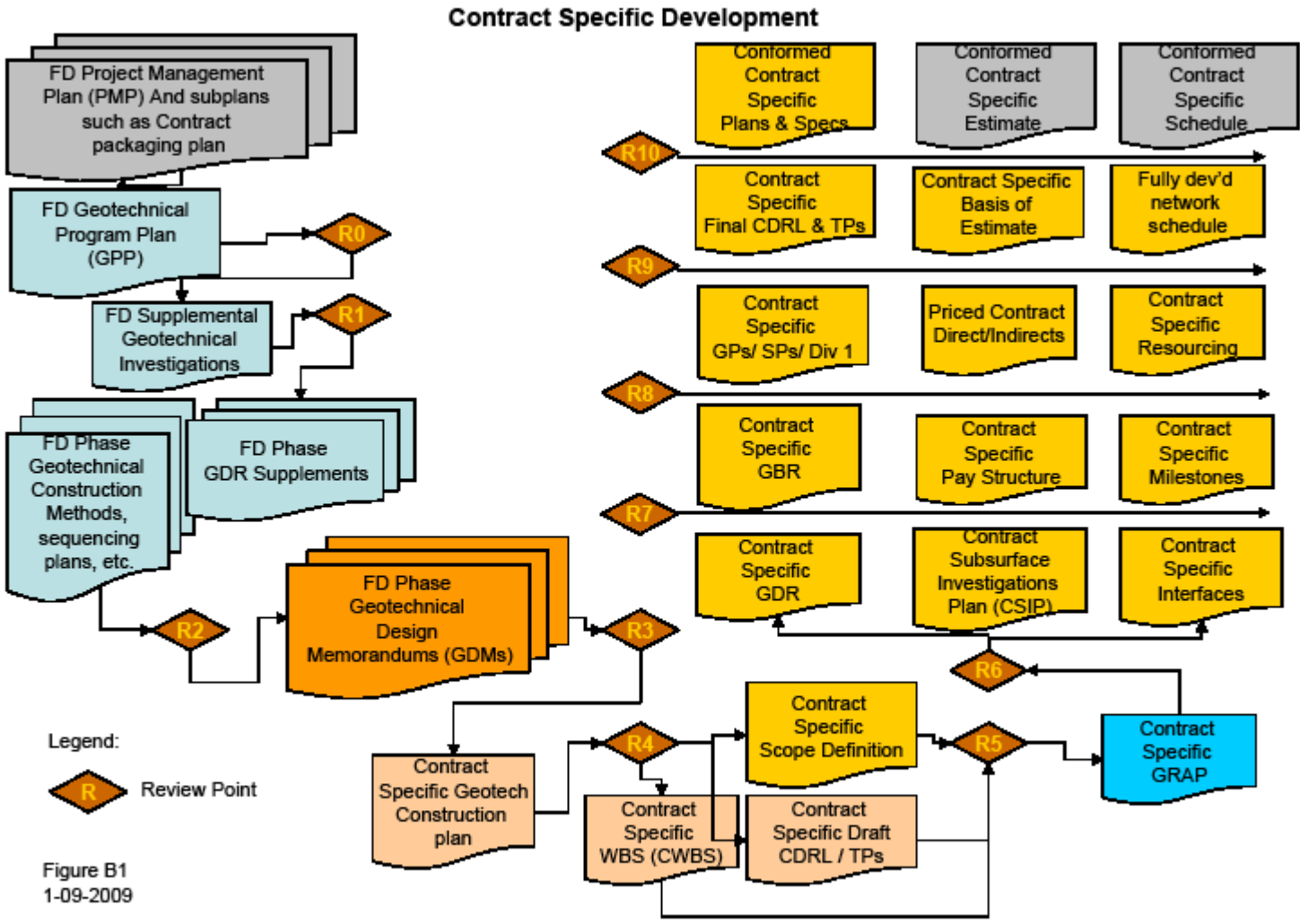
Exhibit 2

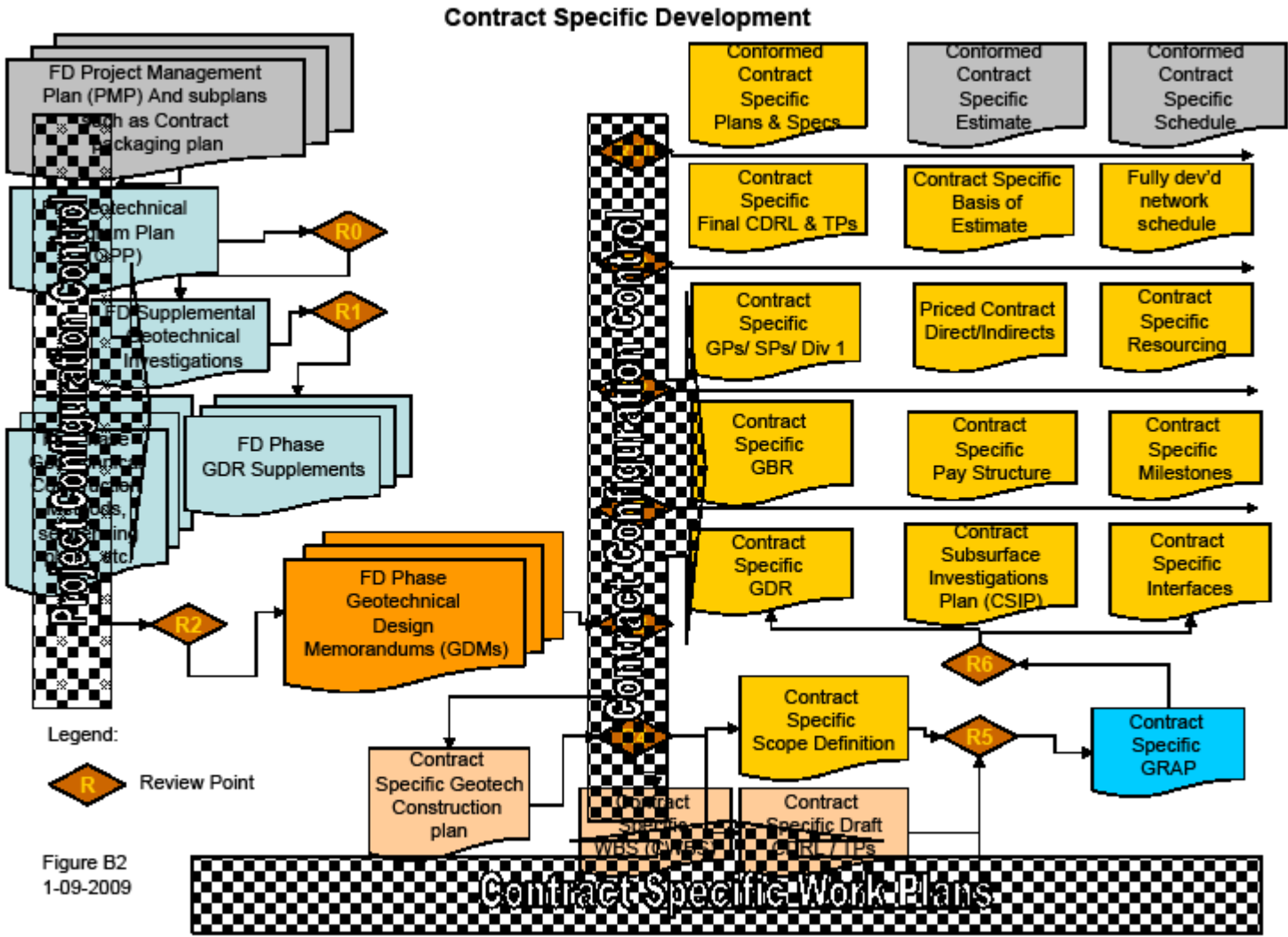
Schedule Contingency Graphic

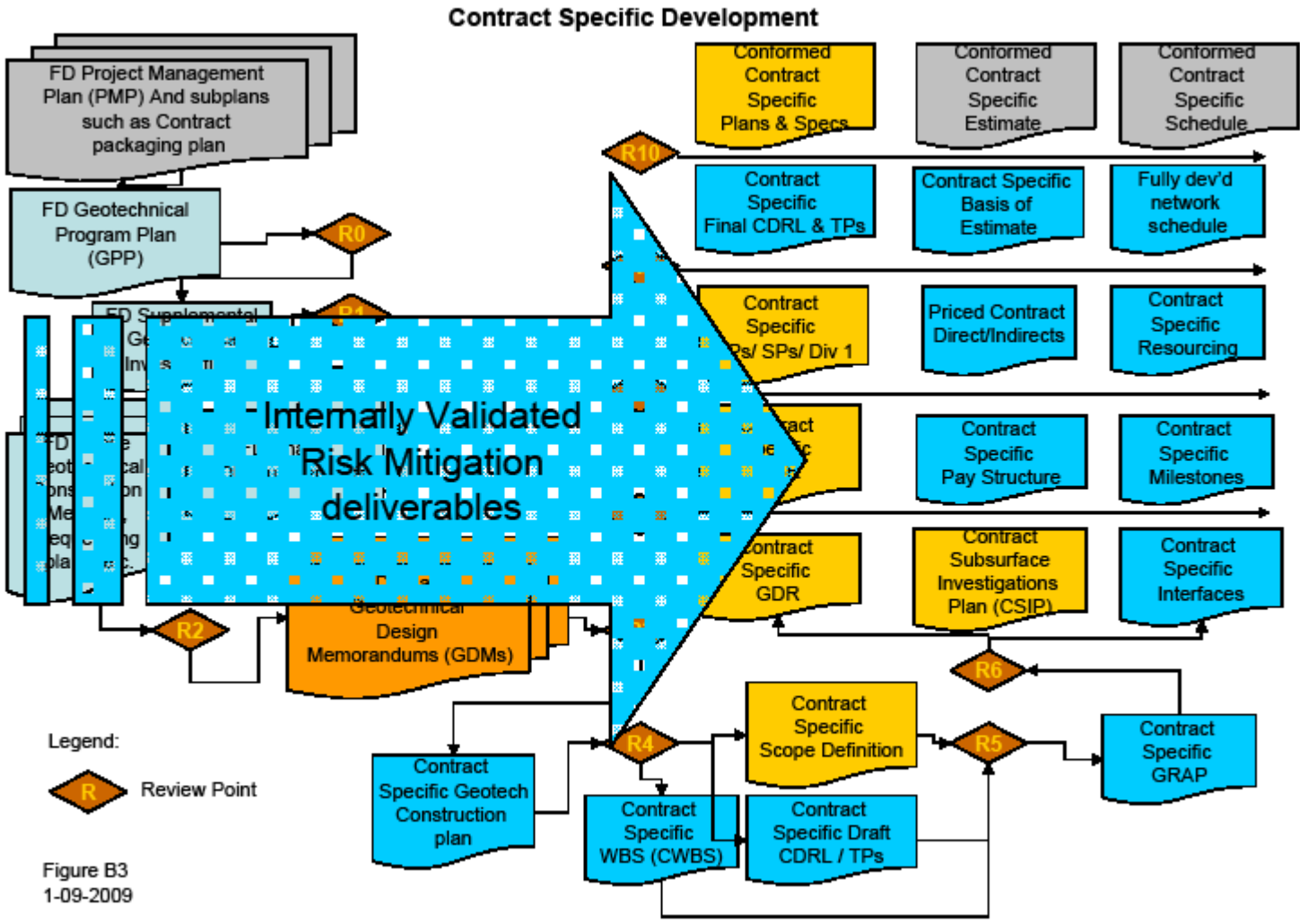
To be developed prior to FFGA Application.

Exhibit 3

Process Flow Charts







OP53 presentation

Part V

Again with Risk data from the 2008 OP53 Prototype management capacities and mitigation strategies in the PEP were augmented by the ARC Project Management Plan, or PMP.



U.S. Department
Of Transportation
Federal Transit
Administration

Region II
Connecticut (Rail Operations)
New York
New Jersey

One Bowling Green
Room 429
New York, NY 10004-1415
212-668-2170
212-668-2136 (Fax)

January 27, 2009

Arthur D. Silber
Chief
Access to Region's Core Project
NJ Transit
Two Gateway Center-17th Floor,
Newark, NJ 07102

Re: New Jersey Transit Access to Region's Core's Project Management Plans

Dear  Mr. Silber:

To receive United States Government financial assistance for a major capital project a grantee must prepare and implement for all project activities a project management plan approved by the Federal Transit Administration. A major purpose of the PMP is to demonstrate the grantee's technical capacity and capability (TCC) to carry out the project. We have received your Project Management Plan (PMP), Revision 10, and find that it meets the minimum requirements; therefore we conditionally approve the document with the proviso that within sixty (60) days of this letter, you submit a revised PMP that responds to the comments in this conditional approval, including incorporating the sub-plans required by the attached Project Execution Plan (PEP).

FTA conducted a risk based evaluation of the ARC project scope, schedule and cost that resulted in revisions to and an overall \$1.6 billion increase in total project cost. As noted at various times during the risk workshops, FTA relies on a "target based" approach that integrates risk management with NJRs regular TCC, thereby increasing NJRs ability to mitigate risk. These targets were developed using a risk based assessment that identified specific out year cost and schedule contingency constraints that NJT must meet in order to ensure that the project can be delivered on time and on budget and identified certain processes that NJT must follow in providing continuous management and administrative direction to the project. It also identified areas, where if NJT falls below the targets, then NJT management is required to take action to address the gap. Use of the target based approach allows FTA and NJT to agree upon implementation timeframes that layout planned upgrades of management deliverables, such as the PMP, that conform to the PEP requirements. These initial timeframes are described below in our comments on Section 17 of the PMP.

FTA began negotiating the details of this mitigation approach with NJT in November 2008 as part of the PEP, which FTA required in order to approve NJRs request for the ARC

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project to enter into Final Design (FD). Since the latest revision to NJRs PMP, Revision 10, was developed prior to finalizing the PEP, it did not anticipate some of the various details required by the PEP, which necessitates substantial revisions to the PMP, and its underlying sub-plans/procedures and supporting documentation such as modifications to existing management plans such as NJRs Risk Management plans, Project OMS plans, third party contractor plans, geotechnical program plans as well as creation of new management plans such as a contingency, cost, and schedule management plans. Furthermore, the PEP process assumes a continuing process of implementation and PMP revision as the project progresses so it is not unlikely that NJT will continue to revise the PMP at key milestones or as conditions change.

The following comments reflect FTA's review of NJRs PMP, Revision 10, as well as the requirements of the PEP and must be addressed within sixty days:

A. Project Management Plan/Management Sub-plan Structure

The PEP requires NJT to implement and maintain with Revision 11 and all later revisions of the PMP, an acceptable management plan/sub-plan structure that ensures orderly and consistent definition of the ARC project, clearly identifying any changing in the project or the management approach. The Revision 11 PMP should be developed and implemented as a master document which controls subordinate management plans at any tier as well as any referenced procedures, and should graphically document the described structure and depict a clear line of delineated individuals in the management chain (in terms of organization graphics and position descriptions) with responsibility to ensure PMP and Project Execution Plan conformance. This would included not only individuals who report directly up the chain to you but also all relationships that encompass other NJT or consultant staff, including how the chain of command works for these non-project specific staff.

B. Requirement for Project Management Plan Conformance

The Revision 11 PMP shall include a separate subsection that summarizes conformance with PEP requirements, referencing and integrating various sections of the PMP, as applicable. This section will describe NJRs overall approach both to developing, modifying, implementing, and maintaining its policies, procedures and contractor scopes to PEP conformance as well as how it will demonstrate that conformance thru documentation and periodic reviews.

C. Specific PMP Section Comments:

The following sections are the minimum section requirements to bring the PMP into conformance with the established PMP requirements as well as the PEP. The areas to be updated are as follows:

Section 1. No comments

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Section 2. Organization and Staffing

Establish a clearly defined "chain of command" that identifies senior level NJT managers who have primary responsibility for implementing the PEP and maintaining conformance and responsibility for project schedule, incentives, and recovery strategies. This should include a description of the role of the Executive Steering Committee, established by the MOU with the Port Authority of New York and New Jersey (PANYNJ)' and any supporting structure that will both evaluate respective issues and provide documented recommendations for decision-making.

Identify a senior director level NJT individual to be assigned primary responsibility for implementing the PEP and for maintaining conformance and responsibility for project schedule, incentives, and recovery strategies.

Provide detailed Organization Charts for NJT and PANYNJ personnel, whether or not assigned to the ARC Project office, who support to the ARC project. A staffing plan that indicates the schedule for filling positions as the project progresses, including recruitment, training, and utilization, should be provided to support the Org Charts.

Section 3. Management Control

Describe, either as a separate section, attachment, or sub-plan, NJT's approach to implementing and maintain a functioning system of adequate internal controls that are independently tested on a regular basis, including but not limited to the (1) allocation of project level work scope and related budget to contract packages, (2) the reallocation of contract package scope and related budget between contract packages is accomplished using a separate account for unpackaged project scope and a double entry system; (3) ensure project definition and contract package development proceeds in conformance with documented NJT business objectives, management plans and directives and (4) management of contingencies.

This approach to internal controls shall include (1) conducting independent, internal control reviews across NJT's functional areas to determine internal control effectiveness, (2) providing internal control training to project personnel, (3) recommending internal control improvements based on the results of the internal control reviews and self assessments and (4) producing a year end report to FTA of NJT's internal control effectiveness at project organization level as well as for all other project support functions, such as Operations and Procurement, by senior management of an organizational function, independent of the project office.

Develop a configuration management (CM) sub-plan that conforms to the following requirements, in addition to existing FTA CM guidance:

- Present NJT's approach to the selection of structures, systems, and components of the ARC project end product(s) and deliverables (collectively known as "project baseline documents" inclusive of "contract specific documents") that is subject to this control.
- Discuss the process of identification, development and maintenance of the project baseline documents.

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- Present NJT's approach to implementing Project Baseline Management.
- Identify selected points in the implementation of the ARC project where the project baseline documentation configuration is established as a reference point or technical baseline.
- Describe how ARC scope, schedule, and cost baselines along with technical data configurations serve as a basis for project management, and as an approved basis for measuring progress and reporting status during project performance. An example of such a process from the US Dept. of Energy is attached as Exhibit 1 to this letter.

Provide a contingency management plan in conformance with the PEP.

Section 4-6. No comments.

Section 7. Procurement of Services

Demonstrate that the procurement process is in conformance with the PEP with respect to individual contracts and the following requirements:

- Re-title Section 7 "Procurement of Services and Construction"
- Section 7.3.1 should be condensed and the material archived to a Section 7 appendix, as appropriate. This section should be refreshed to reflect the ongoing PE scope that will be completed concurrently with FD such as T14.
- Section 7.3.2 should be comparable in level of detail to 7.3.1 and should demonstrate NJT's approach to service contract administration and multi-year contracting for design and CM services.
- Section 7.4 refers to a contract packaging plan. This is inconsistent with the sub-plan entitled Construction Contract Packaging Plan delivered on January 2008. In addition the January 2008 Plan does not define the interfaces at the detail level of Section.4. Therefore the January 2008 plan must be updated to reflect what is being promised in the PMP.
- Source Selection process and details shall be integrated into Section 7.4 and demonstrate conformance with specific NJT Procurement Manual requirements and references in Section 14.
- Section 7.7 needs to specify that PANYNJ will also be complying with provisions in FTA Circular 4220.1 F.

Section 8. Procurement of Materials and Equipment

The fleet management plan should be updated to reflect comments issued by FTA's project management oversight consultants (PMOC) via e-mail on December 24, 2008.

Identify in 8.1 the individual(s) responsible for the management of the facility vehicle interface and the system vehicle. Discuss how these management interfaces will be integrated into the ARC Project office.

Section 9. Design Program

In order to demonstrate conformance with the PEP, include a new section 9.5, entitled "Design Coordination and Geotechnical Coordination" and re-number sections 9.5 thru

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9.10. Revise previous section 9.7 to reflect conformance with the PEP. Amend previous section 9.9 to identify consultant services to address changes during the procurement process.

Section 10. Real Estate Acquisition

Revise the language to be consistent with the Real Estate Acquisition Management Plan (RAMP) sub-plan. The language in the RAMP regarding fixtures should clearly reflect that the use of local funds for additional fixture payments will come from non-project funds. In other local funds which are already included in funding the cost of the ARC project, cannot be used to fund the additional fixture payments.

The approach to acquisition of Amtrak property, whether by easement or fee, needs to be added to the RAMP.

The schedule for real acquisition should be separately identified in the master schedule for the project but section 10.6 should include a discussion on re-baselining both the cost and schedule in conformance with the PEP, with a resource loaded schedule for acquisition attached to the RAMP and included in the master schedule submission. The supporting data for RAMP cost estimate and budget in required in both base year and year of expenditure (YOE) dollars.

Section 11. Community Relations, no comments

Section 12. Construction Program

Describe in 12.6 how NJT will use the contract specific Geotechnical Construction Plan (GCP) to evaluate the contractor's logistics plan submittal. Subsection 12.7, should be revised to be consistent with the PEP.

Section 13. Requirement For Interagency and Master Utility Agreements, Approvals and Permits

This section should be updated in conformance with the PEP. The third party coordination/stakeholder plan and database for the FD phase needs to be revised and resubmitted. All agreements should be identified in the stakeholder plan. The contractor deliverables in 12.7, the Site specific Work Plan listed in 13.1.2, and the contractor deliverables listed in 13.2 should all be consistent.

Section 14. Conflict Resolution

Section 14.1 should be revised to be in conformance with the PEP.

Section 15. Planning for Operations

Update your Operating Plan for the Final Design phase. In order to effectively design the project to meet your primary goal as stated in the ARC design criteria manual section 2.2.1, namely to reliably operate 48 trains into PSNY and NYPSE, you must analyze the impact of perturbed conditions on the reliability of service. Since you have already designed the service to provide 48 trains under normal conditions, and minor perturbations, you must analyze what is needed to provide 48 trains under extreme perturbation conditions. Your

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operations plan needs to be revised to identify what it takes for NJT to meet the reliability factor under both normal operations and more robust perturbation situations. Hence, we request that you resubmit the plan to reflect that type of analysis, prior to any decision on the future use of tail tracks as promised in the FEIS. This plan will help you determine if you will be able to meet your reliability standard without the tail tracks or if other infrastructure improvements are needed. This ensures that as you complete this phase of the project it will be designed to deliver reliable service. In addition, subsection 15.6, should become 15.1 and the old 15.1 should be used later in the section. The first bullet in 15.6 should define and document a process in the form of a systems integration plan to confirm interface compatibility and demonstrate said compatibility through tests or other verification methods.

Section 16. Joint Development, no comments.

Section 17. Project Management Plan Updates and Implementation Timeframes

Requirement for Project Management Plan and Underlying Document Revisions

NJT will implement and maintain throughout the project, an acceptable project management plan/sub-plan update or revision process that is formalized, reduced to procedure, documented and is based upon an understanding of the then current status of NJ Transit's future requirements.

This PMP revision process shall demonstrate how revisions or improvements to the PMP/sub-plans can be obtained through various means, and how changes will be tracked and reported on a scheduled basis including but not limited to process-improvement proposals, measurement of the processes, lessons learned in implementing the processes, and results of process appraisal and deliverable evaluation activities.

Implementation Timeframes

The delivery of upgraded total project cost estimates, baseline cost estimates, and integrated project schedules, which are called for in the PEP prior to certain FTA determinations, are considered to be a part of this implementation timeframe, even if not specifically identified. Unless otherwise noted, all actions will be completed by the end of the referenced quarter (days are calendar days).

Q12009:

- Monthly briefings to FTA for PMP revisions and PEP conformance.
- Third Party Contracts for Design and Construction Management (CM) services finalized and approved by FTA in conformance with FTA circular C4220 requirements, ARC PEP and this PMP letter, within 30 days after approval of entry into final design.
- The formal document control system and document storage for the ARC project is organized and resides in electronic format with full access by FTA and its PMO

contractors within 30 days after approval into final design.

- Source Selection Plans and Contract Specific Work Plans are developed, upgraded to PEP conformance and finalized for 2009 geotechnical procurements within 30 days after approval of entry into final design.
- NJT demonstrates its PMP revision process is in place and is being applied to the development of Revision 11 within 60 days after approval of entry into final design.
- The ARC Management Steering Committee as well as any underlying support structure is implemented and functioning to evaluate respective issues and to provide documented recommendations for decision-making within 30 days after approval of entry into final design.
- ARC Geotechnical Program Plan, inclusive of its sub-plans, is refreshed for the final design phase, upgraded to PEP conformance and finalized within 30 days after approval of entry into final design.
- 2009 award Geotechnical contracts have completed PEP conforming development and internal validation of PEP Exhibit 3 identified deliverables.
- A package specific constructability review shall be completed prior to the issuance of any technical specifications for the quarter.
- ARC Project Management Plan Rev 11 is upgraded to reflect FTA comments on Revision 10 and full conformance with PEP requirements and is submitted to FTA, along with the following sub-plans, within 60 days of final design approval:
 - PE Construction deliverables such as Tunnel Construction Methods and Construction Sequencing are refreshed for Final Design phase use with contract specific construction plans.
 - Configuration Management Plan and Construction Contract Packaging Plan are refreshed for the final design phase, upgraded to PEP conformance and finalized.
 - Deliverable Specific Quality Plans are developed for Geotechnical, Cost and Schedule products and services in conformance with PEP requirements.
 - Project and Third Party Contractor Procedures are upgraded to PEP conformance, the requirements of this PMP letter and finalized.
 - ARC Cost and Schedule Management Plans are developed in conformance with PEP requirements and finalized Project Control Management System is upgraded to PEP conformance and finalized.

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- ARC Project Quality Management Plan inclusive of procedures is upgraded to PEP conformance and finalized.
- Third Party Contractor (Design and CM) Quality Management documentation inclusive of procedures is upgraded to PEP conformance and finalized.
- ARC Cost and Schedule Contingency Management Plans inclusive of procedures are developed in conformance with PEP requirements and finalized.
- ARC Risk Management plan is upgraded to PEP requirements, inclusive of a final Risk Mitigation Framework subsection.

Q22009:

- Monthly briefings to FTA for PMP revisions and PEP conformance.
- ARC Integrated Master Project Schedule, Rev 4 is delivered in conformance with PEP requirements and schedule contingency components are finalized into the PEP as Exhibit 2
- ARC procurement package development is in full conformance with PEP requirements and demonstrates it is meeting project and contractor QMS objectives and internally validated.
- A package specific constructability review shall be completed prior to the issuance of any technical specifications for that quarter.
- ARC Project Management Plan, Revision 11, if revised to reflect FTA comments on the Q1 2009 submission to FTA.

Q32009:

- Monthly briefings to FTA for PMP revisions and PEP conformance.
- NJT demonstrates its PMP revision process and planning for PMP Rev 12, which will focus on the changes coming out of the internal control process and to reflect construction activities, is in place and working as part of its scheduled quarterly progress reviews.
- A package specific constructability review shall be completed prior to the issuance of any technical specifications for that quarter.

Q42009:

- Annual report delivered to FTA of NJT's internal control effectiveness at both the THE Tunnel Team Office level and for other support functions.

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- NJT PEP conformance review completed, updated internal control baseline established, process documentation and report delivered to FTA.
- A package specific constructability review shall be completed prior to the issuance of any technical specifications for that quarter.
- ARC Rev 12 PMP is delivered to FTA in conformance with the Rev 12 revision process and planning commenced in 03 2009..

Q12010:

- Joint FTA and NJT review of project implementation and project management plan/sub-plans inclusive of the risk mitigation framework.

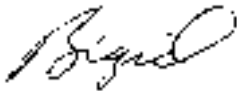
Section 18 Safety and Security Program

This section should be revised in conformance with the PEP. This should include a resource loaded schedule for activities associated with the safety and security elements of the project which should serve as an attachment to the Safety Security Management Plan (SSMP) and should be included in the master schedule submissions. The supporting data for SSMP cost estimate and budget should be in both base year and year of expenditure (YOE) dollars.

Appendix C should be upgraded to be a FD and construction Force Account Plan.

FTA looks forward to working with you during the development of the ARC project. If you have any questions about our comments, please contact Ralph Branche at 212668-2181.

Sincerely



Brigid Hynes-Cherin
Regional Administrator

cc: Anthony Carr-FTA
Larry Penner-FTA
Mike OConnor-FTA
Ralph A. Branche Jr.-FTA
Aaron James-FTA
Chris Nutakor-FTA
Dan Reich-Burns Engineering
George Keeber, Maxine Finkelstein-IEI/DHA
Richard Sarles-NJT
Steven H. Santoro-NJT
Frank Lombardi-PANYNJ
Howard Sackel-PANYNJ

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Exhibit 1

US Department of Energy's Baseline and Configuration Management Process

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January 27, 2009

- Ensure each proposed change to approved baselines is evaluated, reviewed, and approved/disapproved at the proper level of management
- Control the consequences of approved changes
- Prevent unauthorized and unintended deviations from approved baselines
- Ensure each approved change is appropriately implemented, tested and verified, and documented.

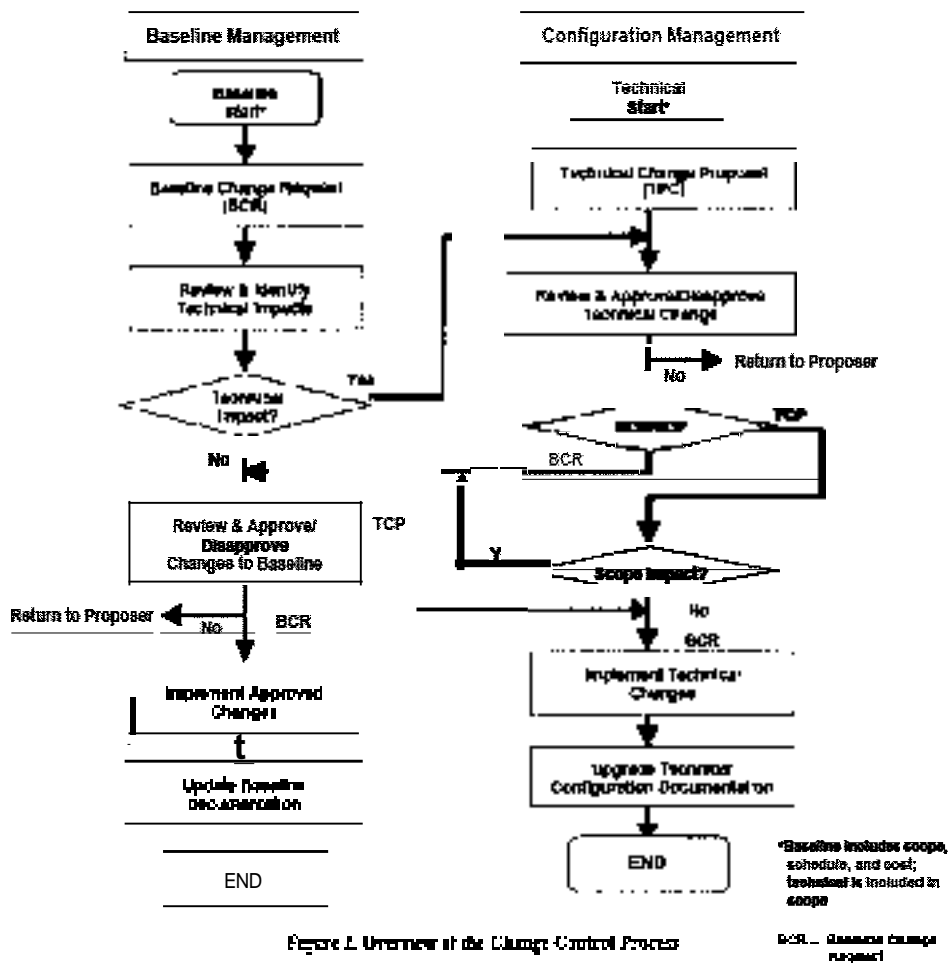


Figure 2. Overview of the Change Control Process

PROJECT MANAGEMENT PRACTICES
Configuration and Change Management (Rev E, June 2003)

OP53 presentation

Part VI

With the 2008 baselines, the ARC project performance for cost control thru 2010 was evaluated using the OP53 prototype materials.

Risk realized from 2008 to 2010

In 2008, the risk forecasts predicted early risk issues for the project were in scale, geotechnical, real estate, soft cost management (mainly final design costs) and escalation.

At that time total geotechnical risk was forecasted in 2008 to be \$1.25bn (2007\$) or \$1.58bn (YOES\$, 1.2626) on a base contract cost of \$2.75bn (2007\$), or \$3.47bn (YOES\$). The basis for the forecast was the geotechnical risk whitepaper which noted that risk was running 45-80% of the entry into FD budget (45% of \$2.75bn is \$1.237bn). In 2010, it was realized that this base was wrong and the actual base for this type of risk was \$1.66bn (YOES\$) and therefore the geotechnical risk premium was \$750mm, also YOES\$. As of Q3 2010, NJT in ARC has realized \$475mm (YOES\$) out of the total forecasted, or some \$275mm to go (\$750 less \$475). Of that remaining \$275mm, approximately \$150mm (\$135mm 2009\$) is in C13R and another \$125mm is in DSC (All YOES\$ UNO). *In other words, the 2008 risk range above the budget of \$1.58bn should have been reduced to \$0.75bn (all in YOES\$), but in 2010 NJT has already realized anywhere from 75% to 100% of the 2008 forecasted pre-award risk depending upon how one forecasted remaining differing site conditions risk.*

Given the bid progress in the geotechnical contracts in 2010, there is no real pre award mitigation opportunity available to NJT.

At the time that Final Design (FD) risk was forecasted in 2008, NJT had budgeted \$137mm; FTA had estimated a range of \$440mm to \$455mm with a variance from NJT's budget of \$303mm to \$318mm (All 2007\$). In 2010, NJT has now budgeted \$270.4mm (2009\$) or \$255mm in 2007\$. This is an increase of \$120mm (2007\$) out of the forecasted \$300mm (also in 2007\$). In 2010, recommended adjustments to the FD budget of another \$115mm (2009\$) or roughly \$110mm (2007\$) provide for an aggregate increase of \$220mm (2007\$) out of the \$300mm (2007\$) forecast due to realized risk. Another \$100-200mm (2009\$) in risk is forecasted for design support to force account and real estate risks. *In other words, the 2008 risk range above the budget of \$320mm (2009\$) should have been \$420mm (all in 2009\$), but in 2010 NJT has already realized 70% of the 2008 forecasted risk (220/320).*

Given the progress to date in Final Design in mid-2010, arguably three-quarters of the mitigation opportunities are gone for NJT.

At the time that Real Estate risk was forecasted in 2008, NJT had budgeted approximately \$400mm (2009\$) and FTA had estimated a risk range above that of roughly \$450mm (2009\$). In 2010, NJT has revised their RE budget to \$572.5mm (2009\$), an increase of \$172mm, or 43%. In 2010, FTA is recommending adjustments of another \$376.5mm (2009\$) for a total increase of \$547mm, say \$550mm (2009\$) against the forecasted range of \$450mm. In 2010, this risk analysis was more detailed than 2008 and further risk range of another \$800mm is recommended. *In other words, the 2008 risk range above the budget of \$450mm should have been \$1,250mm (all in 2009\$) but in 2010 NJT has already realized 40% of the 2008 forecasted risk.*

Given the progress to date in mid-2010, roughly half of the mitigation opportunities in the area are gone for NJT.

At the time that escalation risk was forecasted in 2008, the YOE adjustment factor was 1.2626. In 2010 with the economic conditions of the last two years, the aggregate impact of 2008 and 2009 escalation and a forecast for outlying years brings a revised factor of 1.177 (1.1133+ 0.064). On a base of \$6,894.3 (2009\$) before any adjustments, this reduces the YOE\$ budget by 8.5%, or roughly \$590mm (1.2626 less 1.177, or 0.0853) with contingency (assumed at 16%) ***this becomes a reduction on the project ETPC of \$680mm!*** However, in 2010, NJT has only realized roughly 10-15% of this reduction and given the weakness of the economic recovery seems to be on track to realize possibly 50% of this reduction.

Risk Realization as guide for Mitigation Capacity

In order for NJT to achieve their 2008 risk mitigation target of \$8.7bn (YOE\$) it had to mitigate risk successfully from early in the implementation of the project. Instead, it realized 70-100% of the geotechnical and Final Design risks and 40% of the Real Estate risk while receiving 10-15% of the benefit of the reduced escalation. In all, NJT realized \$865mm in 2008 forecasted risk inclusive of 2010 adjustments (Geotechnical at \$475mm, FD at \$220mm and Real Estate at \$170mm (all YOE\$). This early project work of mitigating geotechnical and final design risk is gone and cannot be recaptured. The only opportunities to mitigate are in later project work elements such as final design for station finishes, systems and force account among other as well as post award management of construction and schedule adherence.

Therefore, the argument is made that NJT is currently operating in the mid range mitigation capacity or Tier 7 risk range. FTA's previous experience with projects in this range includes Sound Transit's Ulink at 64% above the entry into FD budget net of contingency and later cost reductions and LACMTA Redline MOS-3 at 58%.

The question is.. will NJT remain within Tier 7 or management capacity issues ultimately land it in Tier 8? FTA's previous experience with projects in this range includes

- LACMTA Redline MOS-2 FFGA at 79% above the entry into FD budget net of contingency and later cost reductions.. (TCRP G-07)
- NJT HB LRT MOS-1 FFGA at 78% (TCRP G-07)
- TriRail Tampa FFGA and Norfolk VA (HRT) both at 71%

Risk Realization Forecast and Recommendation

Going into Final Design, NJT's project team often quipped in jest that they intended to deliver high performance, .. "they just didn't want to commit to it". Looking back over two years of gauging PEP conformance and implementation... a number of issues have emerged as long running problems ...

- Non-Conformance with "Best Practice" such as Package level WBS integration between scope, schedule and cost; configuration management process issues (inadequate contingency amounts, lack of integration into base budget, varying threshold for approving changes, latency in reporting)
- Non-implementation of Specific Mitigation Capacities such as Management control for geotechnical deliverables, relatively simplistic approaches to risk transfer in large contracts such as the 75% factor in the GBRs, design to budget for station finishes and systems.
- Non-implementation of risk informed decision making and other TCC enhancements such as PMP revision planning process demonstrated by NJT direction to advance CCRs such as CCR16

(Bidirectional Track) and CCR25 (traction power), use of advance directives (aka ADAs) to give contractual direction to suspend work such as Kearny Yard, Hoboken headhouses, integration issues between civil and systems contracts but the reluctance to implement the contract specific work plan process and the critical issues reporting is the most troubling.

The general sense from this analyst's risk review efforts in 2010 is that the reporting to external agencies and NJT senior management lags some 12-15 months behind direction given at the project or sub-project levels. On top of this the risk management planning process has not offered NJT management anything close to a reasonable picture of project risk, key witness is the missing CRR16 and its \$100 million budget buster for over a year! The work plans and critical issue reporting was noted above. The result is they have realized over \$800million of the risk forecasted in 2008.

In this sense the NJT project office has demonstrated a lack of willingness to implement some crucial best practices and key management processes outlined in the 2008 PEP. Compounding this problem is NJT's reliance upon management systems that are not proving reliable data. This deficiency is twofold, one is latency as noted above and the other is a failure to provide a reasonable degree of accuracy. During this 2010 risk review NJT presented their retained risk analysis for C12 (a \$500mm contract) as being in the range of \$20mm (4%) when other projects such as BART, San Diego and WMATA have experienced 10%-35%. Combine this with several other failures to forecast cost growths such as CCR16 and it demonstrates that this critical management system is not providing a reliable framework for .."continuous administrative and management direction of project operations."

Based upon the analysis above, the finding is that ARC is currently at a Tier 7 level: (low, mean and high)

\$10.92bn (60%)	\$10.99bn (61%)	\$11.20bn (64%)
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The conclusion of the above analysis is that the project office and the agency will continue to experience management capacity gaps for the later project risks as they have to date and therefore, the recommendation is to classify ARC as a Tier 8 risk with a forecasted risk range of the following: (low, mean and high)

\$11.67bn (71%)	\$11.94bn (75%)	\$12.22bn (79%)
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Chris Christie, Governor
 Kim Guadagno, Lieutenant Governor
 James S. Simpson, Board Chairman
 James Weinstein, Executive Director

NJ TRANSIT
 One Penn Plaza East
 Newark, NJ 07105-2246
 973-491-7000

MEMORANDUM

TO: Chris Christie, Governor

FROM: ARC Executive Steering Committee
James Weinstein, Chairman (Executive Director, NJ TRANSIT)
James S. Simpson (recused) (Chairman, NJ TRANSIT)
Anthony R. Coscia (Chairman, PANYNJ)
Chris Ward (Executive Director, PANYNJ)
Bill Baroni (Deputy Executive Director, PANYNJ)
Kim Vaccari (CFO, NJ TRANSIT)
Paul Blanco (CFO, PANYNJ)
Lynn Bowersox (Assistant Executive Director, NJ TRANSIT)

DATE: October 7, 2010

SUBJECT: ARC Project Recommendation

Recommendation:

The current ARC project budget is \$8.7 billion. The federal government requires that any costs above \$8.7 billion must be absorbed by the State of New Jersey or other local sources. Based on a detailed financial analysis, it has been determined that the final project is likely to top \$11 billion and could exceed \$14 billion.

As such, the Executive Committee unanimously recommends that the ARC project be terminated and that staff immediately begin an expeditious and orderly shutdown of the project. The Committee also recommends to the Governor that a sensible and affordable alternative for the Northeast corridor be explored.

Background:

Since May 2010, the staff of the ARC project and over 50 engineers and other professionals from both New Jersey and the federal government have been involved in an intensive and exhaustive review of all aspects of the project, including but not limited to: budget, schedule, design and operational integrity, real estate and an extremely detailed risk analysis.

The purpose of this review was to reach an agreement on a final contract between the Federal Transit Administration (FTA) and New Jersey Transit (NJ Transit), known as a federal Full Funding Grant Agreement (FFGA) in order to qualify for the \$3 billion federal share of the ARC project.

This contract would bind the State of New Jersey to fund all of the identified project costs to completion.

In August 2010, each party submitted their respective projected cost range for the project based on their best judgment and experience; an integral and standard step in the FFGA process. To this end, NJ Transit put forth a project range of \$8.7 billion to \$10 billion and the FTA regional staff put forth a project range of \$10.9 billion to \$13.7 billion. It is critically important to note, that these ranges do not include the additional cost for the construction of a new railroad bridge (Portal Bridge South) which is necessary for the operation of the railroad after the tunnel is constructed. Such additional costs are estimated at \$775 million and must be paid for by the State of New Jersey.

On September 10, 2010, the Executive Committee recommended, and the Governor directed a 30-day pause in the execution of new contracts and any new expenditures in order to fully understand the status of project funding and the likely cost of moving the project forward as originally planned.

The 30-day analysis confirmed the total project cost would be in the range of \$11 - 14 billion, including the Portal Bridge South.

Project Costs:

The cost of the project, without Portal Bridge South, is shown in the chart below:

	September 2003	February 2007	March 2008	October 2008	January 2009	September 2010
	Major Investment Study (MIS) Alternative P	Draft Environmental Impact Statement (DEIS) completed	Supplemental DEIS (SDEIS) completed	Final Environmental Impact Statement (FEIS) completed	Record of Decision/Final Design	FFGA Negotiation Range
Cost (in billions)	\$4.3	\$7.4	\$7.6	\$7.6	\$8.7	\$8.7 – \$13.7
Construction Completion Schedule	2015	2016	2017	2017	December 2017	2018
Notes	Conceptual-level construction cost estimate did not include real estate costs, escalation or contingency. Comparison with subsequent cost estimates not relevant.	First comprehensive cost estimate for the project which provided contingency, real estate, and escalation from estimate date to construction time.	Modified project alignment and depth to mitigate geotechnical, environmental and community concerns. Schedule extended by one year to account for additional environmental review (SDEIS).	No change to budget or schedule from SDEIS cost estimate in March 2008.	FTA required an additional \$1 billion in contingencies and a higher escalation rate than previously calculated (3.2% to 4.25% annually), raising the project cost to \$8.7 billion.	The purpose of the final review was to reach agreement on a final contract between the FTA and NJ TRANSIT, known as a federal Full Funding Grant Agreement (FFGA) in order to qualify for the \$3 billion federal share of the project.

It is important to reiterate that any ARC cost above the \$8.7 billion must be absorbed by the State of New Jersey. The federal commitment is capped at \$3 billion. Based on the range of estimates, New Jersey and/or its non-federal sponsors would have to demonstrate an ability to fund anywhere from \$2 billion up to \$5 billion, more than the current budget.

Expenditures to Date:

The actual cash spent through September 30, 2010 is approximately \$478 million, some of which may be partially recovered if the project is terminated. These funds have been expended for engineering, property acquisition, construction, insurances and professional services. Some of the funds expended for items such as real estate have enduring value for the holder of the project (NJ Transit or the Port Authority of New York and New Jersey).

These expenditures were largely undertaken under the auspices of two Early Systems Work Agreements issued in 2009 and earlier this year by the FTA as the parties progressed toward FFGA. Those agreements gave specific authority to undertake certain tasks and expenditures that would be reimbursed by the FTA once the FFGA was agreed upon.

All of the expenditures were consistent with the project management plan and Record of Decision (ROD) for the Environmental Impact Statement which demonstrated the justification for the project.

In Conclusion:

The Committee fully recognizes the value and benefit that a cross Hudson transportation improvement would bring to New Jersey's transportation system and that of the entire region. The Committee also understands that this action may result in the loss of \$3 billion in discretionary federal New Starts money. Nonetheless, it is the judgment of the Committee that in the current economic climate, New Jersey and its project partners cannot afford this project and recommend its immediate and orderly shutdown.

LaHood clarifies: Tunnel cost estimates range from \$9.775B to \$12.7BPosted By [John Schoonejongen](#) On October 22, 2010 @ 2:30 pm In [Uncategorized](#) | [8 Comments](#)

The following is a press statement from Ray LaHood, seeking to clarify recent reports of the cost of the ARC tunnel project:

U.S. Transportation Secretary Ray LaHood Statement on the ARC Tunnel Project

Washington, DC – U.S. Transportation Secretary Ray LaHood made the following statement today on the ARC Tunnel project:

“In response to press reports, I want to clarify the range of numbers regarding the ARC tunnel project.

“The Department of Transportation has estimated the low-range cost of the project at \$9.775 billion. The mid-range estimate is \$10.909 billion and the high-end range is \$12.708 billion.

“For complex projects, we do a range of estimates in the interests of accuracy. However, DOT is committed to working together through the life of the project to keep costs down to the lowest estimate.

“In addition, we’ve been discussing with New Jersey officials the simultaneous construction of the \$775 million South span of the Portal Bridge project.

“We are committed to continuing the constructive dialogue we have had for the last two weeks with New Jersey officials to find a way to move forward on the ARC tunnel project, which will double commuter train capacity between New Jersey and New York.”

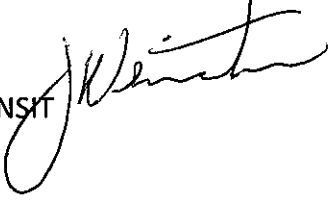
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Memorandum

TO: Chris Christie, Governor, State of New Jersey

FROM: James Weinstein, Executive Director, NJ TRANSIT 

DATE: October 26, 2010

SUBJECT: ARC Project Negotiation Review and Recommendation

Recommendation:

Despite strong efforts by the federal and state participants in the ARC discussions during the last two weeks, we have been unable to reach agreement on terms that would assure New Jersey's taxpayers would not pay more than \$2.7 billion for a completed Trans Hudson Express ARC project. In view of this, I recommend we continue to move forward with the orderly and expeditious shutdown of the project while continuing to explore solutions to the trans-Hudson transportation challenge.

Background:

On October 7, 2010, the ARC Executive Steering Committee unanimously recommended to terminate the project and immediately begin an expeditious and orderly shutdown.

This recommendation was based on the fact that after 5 months of intense negotiations, New Jersey Transit and the Federal Transit Administration (FTA) were unable to reach an agreement on a final ARC project cost projection. Throughout these negotiations, the federal government has insisted that any costs above \$8.7 billion must be paid by the State of New Jersey or other non-federal sources.

In August 2010, each party submitted their respective projected cost range for the project based on their professional judgment and experience; an integral and standard step in the Full Funding Grant Agreement (FFGA) process.

NJ Transit put forth a project range of \$8.7 billion to \$10 billion. On August 16, 2010 the FTA put forth a project range of \$10.9 billion to \$13.7 billion. Based on a detailed financial analysis submitted by the FTA to NJ TRANSIT on August 16, 2010 (document A), the FTA determined that the final project cost would range from \$10.9 billion up to \$13.7 billion.

Based on this cost estimate, the FTA made it clear that New Jersey would have to demonstrate an ability to fund an additional \$2 billion to \$5 billion. This cost does not include Portal Bridge South.

On October 7, 2010, faced with the FTA's requirement that New Jersey guarantee all costs above \$8.7 billion in order to qualify for the \$3 billion federal share of the project, and recognizing the extraordinarily difficult financial condition of the State, the Executive Steering Committee of the ARC project recommended that Governor Christie terminate the project.

On October 8, 2010, in a joint meeting between Governor Christie and US DOT Secretary LaHood and their respective teams, federal officials put forward an updated project cost range of \$9.8 billion as the low end estimate, \$10.9 billion as the mid range estimate and \$12.7 billion as the high end estimate.

Federal transportation officials have advised us that there is an approximately 10 percent probability of the project being completed at or below the low range cost, approximately 40 to 50 percent probability of the project being completed at or below the mid range cost and approximately 83 percent probability of the project being completed at or below the high range cost.

Furthermore, this range did not include the additional \$775 million that New Jersey would be required to spend to build the Portal Bridge South. The FTA is requiring New Jersey to build the Portal Bridge South as part of the ARC project through the Record of Decision (ROD) for the project. Consequently, the additional \$775 million cost of the Portal Bridge South must be included in the cost of this project to New Jersey.

Discussion Points:

As a result of the meeting, the Governor and Secretary directed their teams to spend the next two weeks attempting to find ways to address the issues and concerns raised with particular emphasis on how potential cost overruns would be handled and identifying a solution that did not put New Jersey taxpayers at risk.

To this end the efforts of the group focused on key areas and concerns raised during the October 8, 2010 meeting.

Phasing in the project by reducing scope in the near term.

A thorough review made it clear that this approach would only delay, but not eliminate, New Jersey's responsibility for the higher costs while significantly diminishing the value of the project to large numbers of transit users.

Financing the project through the Federal Railroad Rehabilitation & Improvement Financing (RRIF) loan program.

Under the RRIF loan program the Federal Rail Administration (FRA) is authorized to provide direct loans and loan guarantees of up to \$35 billion. These loans can fund 100% of a qualified railroad project with repayment periods of up to 35 years at interest rates equal to the cost of borrowing to the government. Additionally, repayment would not begin for six years after first draw down of the loan. This was discussed as a way of covering New Jersey's full share of project costs (\$2.7 billion) as well as any amount above the \$8.7 billion budget. Ultimately, regardless of the terms, this is a loan that the taxpayers of New Jersey are responsible for repaying. In no way does this option

diminish the burden on New Jersey and in fact this option ensures that New Jersey taxpayers will be paying for any project costs above the \$8.7 billion budget.

Securing a Public Private Partnership (PPP).

The Federal team pointed to the success of PPPs involving the Port of Miami Tunnel, Denver Union Station and the Denver Eagle transit project. It was pointed out that there is interest in doing some part of the ARC project as a PPP and that such a partnership could be used to address cost and technical risk while fixing the price of elements such as the new rail station and the tunnels. It would, however, take a significant amount of time (at least 18 months) to develop and implement a PPP and there is no guarantee it would be at an acceptable price or on acceptable terms. Ultimately, even if a PPP could be secured, New Jerseyans would be responsible in some fashion for the costs to pay for it.

New Station Location.

There was discussion on ways to more closely tie the proposed new ARC station under 34th Street to existing Penn Station, as well as using the new station to create increased regional and national benefits that will in turn attract additional funds for the project in the future. Even if this aspect of the project was successfully implemented, it would not provide a means for covering current cost overruns nor the contingencies necessary to conclude a funding agreement with the FTA. Simply, it would not hold New Jersey's taxpayers harmless from cost increases and overruns that have already emerged and may continue to emerge as the project is constructed.

On Sunday, October 24, 2010 the Governor and Secretary met to discuss the Federal government's proposals. Deputy Secretary John Porcari outlined four approaches based on the assumption that the total cost of the project is \$11.7 billion (FTA mid-range cost estimate together with the Portal Bridge South).

The approaches included one or more of the following elements:

- Increased Federal, PANY/NJ and State of New Jersey contributions of \$378 million each to fund the difference between the \$8.7 billion budget and the FTA low end cost estimate of \$9.8 billion, excluding both the Portal Bridge South and any contingency for the approximately 90 percent likelihood that the project cost will exceed the low end cost estimate;
- A federal RRIF loan ranging from a low of \$775 million to cover the cost of construction of the Portal Bridge South to \$2.3 billion to cover the increased state share of the difference between the \$8.7 billion budget and the FTA low end cost estimate of \$9.8 billion (\$378 million) plus the cost of the Portal Bridge South and contingency funds required based on the mid-range cost estimate;
- A Public Private Partnership contribution of \$1.85 billion, representing the difference between the \$8.7 billion budget and the FTA low range cost estimate of \$9.8 billion plus the amount required for the Portal Bridge South; and,
- Near-term scope reductions of \$700 million.

Conclusion

While significant effort and thought was put into this by all involved, the federal New Starts contribution to this project of regional and national significance would be capped at \$3.378 billion (even with \$378 in additional federal funds), regardless of the ultimate cost of the project. When the contingency required by the Federal government for the mid-range cost estimate is included, it would mean the Federal share would be less than 29% of the funding challenge facing New Jersey.

The Federal government continues to insist that New Jersey and the PANYNJ be financially liable for substantial costs beyond the current project budget of \$8.7 billion. The value and benefit that a cross Hudson transportation improvement would bring to New Jersey and the entire region is not in question. However, at a time when New Jersey's economy is under extreme stress and the financial strength of the State is at a low point, the taxpayers are in no position to bear the open-ended cost for this project that would be required to obtain a Full Funding Grant Agreement from the FTA.

Based on the foregoing, the October 7, 2010 recommendation of the ARC Executive Steering Committee should continue to be implemented while New Jersey Transit pursues alternate, affordable solutions to the trans-Hudson transportation challenge.

Millions of \$	NJT Capital Cost Estimate at Entry into Final Design Jan	NJT Capital Cost Estimate Rev 11 April 2010 Cost in	FTA 2010 Adjustments Rev11 OP 53 Optimistic	Mid Range Risk Medium Mitigation Capacity	Pessimistic Low Mitigation Capacity	Pessimistic Very Low Mitigation Capacity	Assumptions
Base Construction Cost	4,880	5,006	5,006	5,816	5,816	6,136	Marginal Cost additions for the Low and very low
Geotechnical Scope			135	0	20	20	Production rates for tunnels and caverns, TBM downtime, contractor contingencies
Geotechnical Project Delivery				0	0	0	Single bidder premium, contractor margins/overheads, procurement schedule delays, impacts to other contractors
Other (Direct and Indirect Adjustments)			525				The PMOC assessed these mechanical adjustments to the base.
Pre Award Design Solution			150		100	100	There will 200 million in CCR and we think they will hit 2-50M more. This was to cover ADA CCR, etc.
Stakeholder Risk (Amtrak, PANYNJ, NJT, Others)				0	200	200	Power distribution, Construction interfaces on the NEC and NYP, Finishes in the Caverns
Construction Subtotal	4,880	5,006	5,816	5,816	6,136	6,456	
Professional Services	495	1057	1057	1237	1237	1,450	
PE+EPE+Final Design+Post FD			114.9	0	105.1	212.4	Historical experience on heavy rail, Seattle and Pittsburgh delays. Design Services for R.E. Startup Force Account
Construction Management			65	0	108.3	261.1	Project is 12 months longer
Professional Services Subtotal	495	1057	1237	1237	1450	1924	
Real Estate	395	572.5	572.5	949	949	1389	
Commercial Real Estate			376.5	0	340	200	Restriction declarations on titles, Premium settlement cost, etc.
Stakeholder Risk (Amtrak)				0	100	150	NEC Corridor ROW costs, NYPSE costs, W Manhattan yards
Real Estate Subtotal	395	572	949	949	1389	1739	
Vehicles	221	258	258	258	258	258	
Procurement Risk (Coaches)				0	0	0	Reprocurement risk, currency risk were added to the project. In contract
Procurement Risk (Locomotives)				0	0	0	Currency risk, tax risk, performance risk. In Contract
Vehicles Subtotal	221	258	258	258	258	258	
Base Year 2009\$ Total	5,991	6,894	8,260	8,260	9,233	10,377	
Escalation Assumptions	4.25% thru 2017 (1.1392)	3.2% 2009 thru 2019 (1.113 YOY Factor)	3.2% Avg thru 2021 (1.113 YOY Factor)				
Escalation Increase				1.113	1.113	1.113	YOY Factor Allows for 2020 and 2021 RSD.
Total YOES	6,826	7,675	9,193	9,193	10,433	11,726	
Contingency Assumptions							Contingency Allocated
Post Award Retained Risk	1,876	1024	1450	1,450	1,450	1,450	
Differing Site Conditions Reserve	314		100	100	214	425	
			135	135	135	135	Other
Grand Total (YOES)	8,701	8,699	10,878	10,878	12,232	13,736	

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Timeline for ARC Funding Information and Decisions in the Christie Administration

Everyone,

You might find helpful this timeline describing ARC project funding and deliberation milestones since Governor Christie took office, particularly how the Governor was forced to re-examine the project in mid-August when the Federal Transit Administration presented its first thorough examination of the potential cost overruns for the project. As we now know, the range given then – \$10.878 billion to \$13.736 billion, not including the \$775 million for a new Portal Bridge – far exceeded the working assumption of an ARC tunnel project at \$8.7 billion plus the cost of the Portal Bridge.

Also, an important reminder given what is still appearing in some press reports: None of the proposals put forth by federal officials or New Jersey's congressional delegation – despite unsupported statements to the contrary – eliminate, or even remotely limit, New Jersey's exposure to the potentially billions in cost overruns. Loans or any phase in of the project merely delay the costs to New Jersey and its taxpayers. I repeat – none of the alternatives offered change the fact that New Jersey would be solely on the hook for all ARC tunnel overruns.

Finally, please take a look at this [Bond Buyer story](#) today, which describes extra funding to Florida and California for additional billions for large rail projects which already had received billions in federal funding. As the Governor noted in today's availability, these additional funding commitments from the federal government come even as those states have only a fraction of the state funding commitment for their projects, as compared to the 70 percent New Jersey (including Port Authority) responsibility in the ARC project.

Contributors

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Deputy Press Secretary

More Information

Posted 10/27/2010 By Michael Drewniak

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FTA OP 53 Presentation
The ARC Project Full Funding Grant Agreement (FFGA) Chronology
February – October 2010

February 2010	Governor Christie meets with Secretary LaHood regarding ARC project funding during which they make it clear that NJ is responsible for potential overruns and federal participation is capped at \$3 billion
March 26, 2010	Secretary LaHood issues written assurance that project funding is in place and NJ understands that the federal full funding grant agreement is capped at \$3 billion.
April 6, 2010	Governor Christie Reaffirms New Jersey's \$2.7 B contribution to ARC in letter to Secretary LaHood
April 14, 2010	Amended Early Systems Work Agreement II to include the Palisade tunnel scope
May 3, 2010	Initial Full Funding Grant Agreement workshop with Federal Transit Administration (FTA)
May 17, 2010	Release of USDOT Inspector General Report: Actions Needed to Mitigate Risks Associated with the ARC
June 7, 2010	FTA Administrator remarks at APTA Rail Conference, Vancouver, Canada place project cost between \$9 and \$10 billion
June 11, 2010	ARC Scope workshop (Participants: ARC Team and FTA)
June 18, 2010	ARC Schedule workshop (Participants: ARC Team and FTA)
June 18, 2010	FTA provides Congress with an amendment to NYC transit projects and emphasizes no more increase will be approved
June 21, 2010	ARC Cost workshop (Participants: ARC Team and FTA)
June 23, 2010	ARC Risk & contingency workshop (Participants: ARC Team and FTA)
July 22, 2010	ARC Risk workshop (Participants: ARC Team and FTA)
July 26, 2010	ARC Risk workshop (Participants: ARC Team and FTA)
August 16, 2010	First cost range presented by FTA \$10.878-13.736b (<i>dated: ARC Risk 08-03-10 final – attached</i>)
September 10, 2010	The ARC Executive Steering Committee authorizes a 30-day suspension of project to complete a comprehensive cost and risk assessment, as well as to identify the cost of permanently suspending the project.
October 7, 2010	The ARC Executive Committee recommends to Governor Christie to terminate ARC
October 8, 2010	Joint meeting between Governor Christie and US DOT Secretary LaHood Federal officials put forward a reduced project cost range of \$9.8 billion to \$12.7 billion, exclusive of any costs for the \$800 million Portal Bridge South which FTA was requiring in order to open the tunnel project upon construction completion.

FTA OP 53 Presentation
The ARC Project Full Funding Grant Agreement (FFGA) Chronology
February – October 2010

- October 8-22, 2010 ARC Project Negotiation Review, USDOT, FTA, NJT, and NYNJPA
- October 24, 2010 Governor Christie and US DOT Secretary LaHood meet to discuss the review work of their respective teams during the preceding two weeks and discuss the alternatives developed.
- October 26, 2010 NJT Executive Director Weinstein recommends to Governor Christie to move forward with the orderly shutdown of ARC
Despite strong efforts by the federal and state participants in the ARC discussions, an agreement on terms that would assure New Jersey's taxpayers would not pay more than \$2.7 billion for a completed Trans Hudson Express ARC project could not be reached.

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Contingency Assumptions							
Post Award Retained Risk	1,876	1024	1450	1,450	1,450	1,450	Contingency Allocated
Differing Site Conditions Reserve	314		100	100	214	425	
Grand Total (YOES)	8,701	8,699	10,878	10,878	12,232	13,736	Other

ARC Risk 08-03-10 Final

OP53 presentation

Part VII

The ARC experience became the basis for developing the required Management Capacities and mitigation framework for the MTA ELPEP

I. BACKGROUND

a. MTA Program

The Metropolitan Transportation Authority (MTA) is an organization, inclusive of its subsidiaries and affiliates, who have contracted with the Federal Transit Administration (FTA) for two FFGA projects. MTA is the FTA Grantee, and MTA Capital Construction ("MTACC") is the MTA subsidiary that is managing these projects. MTACC is implementing the East Side Access (ESA) and Second Avenue Subway (SAS) FFGA projects for the benefit of two of its operating agencies, Long Island Rail Road (LIRR) and New York City Transit (NYCT) respectively, who provide the necessary operating interface to assure that the project as built will meet their needs. Moreover, key management responsibilities, such as funding, remain in MTA headquarters. FTA has worked with MTA in general and with MTACC in particular to effectively and efficiently manage risk throughout project implementation, relying on the technical capacity and capability (TCC) of MTA as a whole as the mechanism for assuring that those implementation actions can and will be met. As used herein, the term MTA generally means the applicable MTA agency responsible for a particular action required by this Enterprise Level Program Execution Plan (ELPEP), as more specifically referenced in Project Management Plans ("PMPs"), inclusive of future revisions to those PMPs, maintained by MTACC.

FTA has also worked with MTACC to identify mitigation tools designed to provide the greatest level of assurance that the MTA FFGA Projects (ESA and SAS) can proceed through the final design and construction phases and be delivered to the start up phase consistent with the revised budget and schedule. This level of assurance is predicated upon the mitigations accomplished to date, the revisions to the budget, and MTA's commitment to undertake the principles in this document thus providing FTA with reasonable assurances that MTA management processes will be focused on fundamentally sound decision-making, driven by a thorough understanding and implementation of risk informed project strategies.

The management capabilities and risk mitigation capacities identified through this effort between FTA and MTA have resulted in core principles which are believed to be common to both FFGA projects with the exception of specific cost and schedule contingency management targets for the individual projects. The benefit to MTA of common capabilities and capacities is to allow MTACC to achieve economies of scale in applying these principles, performing management oversight, and implementing lessons learned. The principles and requirements in this document are to be used at the highest level within MTA, as appropriate, and MTACC, in particular, for implementing its FFGA projects. In implementing these principles, the subsequent changes to the Project Management Plans must identify all of the necessary interfaces between MTACC and the rest of the MTA organization.

Under FTA's FFGA guidance, as stated in C5200, Chapter III, the Baseline Cost Estimate (BCE) is a critical tool for project oversight; it enables FTA and its Project Management Oversight Contractor (PMOC) to monitor Project costs throughout design and construction by comparing the Grantee's actual expenditures to the costs as originally estimated. For this reason FTA does not allow any modification of the BCE as described in Attachment 3A to an FFGA, but instead uses an Estimated Total Project Cost (ETPC), as defined in C5200, Section III.4, Cost Terminology, to reflect the total anticipated costs of the Project at any point in time. Because of cost increases that have occurred after FFGA award, the Estimated Total Project Cost for these projects is larger than the BCE as reflected below.

b. ESA FFGA

A series of working sessions between the MTA and FTA and its Project Management Oversight Contractor (PMOC) were conducted during the last week of August 2006 to support FTA's programmatic decision to award MTA a full funding grant agreement (FFGA) for the ESA project by developing data to support MTACC's project execution strategy (PES) documented in a September 2006 Technical Memorandum of

Enterprise Level Program Execution Plan (ELPEP)
For the MTACC's Eastside Access and Second Avenue Subway FFGA Projects
January 15, 2010

Understanding (MOU) for Grantee's FFGA Project. The result was a Baseline Cost Estimate (BCE) of \$6.350 billion, exclusive of financing costs, with a contingency level of \$855 million and a Revenue Operations Date (ROD) of December 2013 which was reflected in the FFGA for the ESA project. FTA currently refers to the ROD as the Revenue Service Date (RSD) to distinguish it from the Record of Decision used to establish completion of the environmental review process.

After award of the ESA FFGA on December 18, 2006, MTA performed a series of internal reviews throughout 2008/2009 with a proposed estimated total project cost (ETPC) of \$7.791 and a proposed RSD of September 2016 based on its risk range evaluation of \$7.683 billion to \$8.476 billion.

In the spring of 2009, FTA undertook a risk assessment of the MTA proposal in order to evaluate MTA's past performance and validate their assumptions for going forward. FTA's PMOC then made material findings with respect to the MTA's definition of the ESA project as well its support and rationales for the revised project cost estimate and schedule. Based upon these PMOC findings, risk analysis documentation and FTA's own program experience, FTA developed a risk range of \$8.393 to \$9.313 billion for the ESA project. This range was ultimately reduced based on a better understanding of the varying assumptions used by MTA and FTA, and a commitment by MTA to use the principles in this document to manage the project. The current FTA risk range is \$7.769 to \$8.466 billion.

FTA and MTA entered into negotiations throughout the fall of 2009 in order to reach agreement on what number should be agreed to as the new ETPC, exclusive of financing costs, for purposes of an amended FFGA. That number as reflected in this document, will be based on an ETPC of \$8.119 billion in year of expenditure dollars (YOES), with a total contingency level of \$722 million in YOES, and a RSD of April 2018 and a schedule contingency of 18 months on the critical path.

Based upon its risk evaluations of the ESA project, MTA believes the project can be completed for its current working budget (hereafter referred to as CWB) of \$7.791 billion in YOESs and in its current working schedule (hereafter referred to as CWS), by September 2016, and has developed its Integrated Project Schedule (IPS) Rev UPD #07, updated as of November 23, 2009 accordingly. The CWB noted above includes \$463 million for rolling stock that is currently being carried by the MTA in a separate reserve. MTA is evaluating the appropriate rolling stock needs for ESA, which decision may either increase or decrease their CWB. The FTA has not received sufficient information to reach a decision on MTA's assessment and the funds will remain in the CWB and ETPC until FTA decides if the number of vehicles can be modified. The MTA's Target Budget as reported to the MTA Board and maintained in its Quarterly Reports is \$7.328 billion, with an additional \$463 million in reserve, and will be adjusted as the rolling stock issue is finalized.

MTA and FTA understand and agree that MTA will use its best efforts to deliver the ESA project within this CWB amount of \$7.791 billion and by the CWS date of September 2016. It is also understood that the difference between this MTA CWB and FTA's EPTC amount of \$8.119 billion results in \$328 million in secondary cost mitigation as that term is discussed further below in this ELPEP. Therefore, any increases in the MTA CWB for ESA above \$7.791 billion must be funded using this secondary cost mitigation capacity. Further, MTA warrants that it is prepared to take the steps necessary as outlined in this ELPEP to identify and apply for any funding developed as a result of this secondary cost mitigation capacity in a timely manner. This strategy will be implemented in a manner based on forecasted funding needs. It is acknowledged that MTA's decision to apply for funding will be based on the actual need for such funding to award contracts or to meet contractual obligations and will be taken in sufficient time so as not to delay the award of such contracts or payment of such obligations.

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c. SAS FFGA

A series of working sessions between the MTA, inclusive of its organization components, such as MTACC and the MTA's independent engineer (MTAIE), FTA and its PMOC were conducted during March and April, 2007 to develop data to support MTA's execution strategy for SAS and resulted in the then termed "Project Execution Strategy and PMP Scoping Document" dated August 20, 2007. Critical to that effort was an agreement in 2007 by FTA and MTACC to increase the project budget by \$160 million in cost contingency, and to add 6 months in schedule contingency. The result of these 2007 discussions was a BCE of \$4.05 billion, exclusive of financing costs, with a total contingency level of \$555 million and a schedule contingency of 6 months and a ROD of June 2014 as reflected in the FFGA for the SAS project. After award of the SAS FFGA on November 19, 2007, MTA performed a series of internal reviews throughout 2008/2009 with a proposed ETPC of \$4.673, exclusive of financing costs, and a proposed RSD of December 2016 based on its risk range evaluation of \$4.522 to \$4.993 billion.

In the spring of 2009, FTA undertook a risk assessment of the MTA proposal in order to evaluate MTA's past performance and validate their assumptions for going forward. FTA's PMOC then made material findings with respect to the MTA's definition of the SAS project as well as its support and rationales for the revised project cost estimate and schedule. Based upon these PMOC findings, risk analysis documentation and FTA's own program experience, FTA developed a risk range of \$5.200 to \$5.950 billion for the SAS project. This range was ultimately reduced based on a better understanding of the varying assumptions used by MTA and FTA, and a commitment by MTA to use the principles in this document to manage the project. The current FTA risk range is \$4.744 to \$5.213 billion.

FTA and MTA entered into negotiations throughout the fall of 2009 in order to reach agreement on what number should be agreed to as the new ETPC, exclusive of the financing costs, for purposes of an amended FFGA. That number as reflected in this document, is based on an ETPC of \$4.980 billion in YOES\$, with a total contingency level of \$510 million in YOES\$, and a RSD of February 2018 and a schedule contingency of 13 months on the critical path.

Based upon its risk evaluations of the SAS project, MTA believes the project can be completed for its current working budget (hereafter referred to as CWB) of \$4.673 billion in YOES\$ and in its current working schedule (hereafter referred to as CWS), by December 2016, and has developed its Integrated Project Schedule (IPS) Rev 3, updated as of August 2009 accordingly. The CWB noted above includes \$222 million for rolling stock, which the MTA believes can be accommodated through a small reduction in NYCT's spare fleet which would reduce the cost of the project. The FTA has not received sufficient information to reach a decision on MTA's assessment and the funds will remain in the CWB and ETPC until FTA decides if the number of vehicles can be modified. Until that time, the MTA's Target Budget as reported to the MTA Board and maintained in its Quarterly Reports is \$4.451 billion, and assumes the savings from the vehicles will be achieved. If necessary, the CWB will be adjusted once the rolling stock issue is finalized.

MTA and FTA understand and agree that MTA will use its best efforts to deliver the SAS project within this CWB amount of \$4.673 billion and by the CWS date of December 2016. It is also understood that the difference between this current MTA CWB and FTA's ETPC amount of \$4.980 billion results in \$307 million in secondary cost mitigation as that term is discussed further below in this ELPEP. Therefore, any increases in the MTA CWB for SAS above \$4.673 billion must be funded using this secondary cost mitigation capacity. Further, MTA warrants that it is prepared to take the steps necessary as outlined in this ELPEP to identify and apply for any funding developed as a result of this secondary cost mitigation capacity in a timely manner. This strategy will be implemented in a manner based on forecasted funding needs. It is acknowledged that MTA's decision to apply for funding will be based on the actual need for such funding to award contracts or to meet contractual obligations and will be taken in sufficient time so as not to delay the award of such contracts or payment of such obligations.

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II. PURPOSE

This document reflects the ELPEP and resultant Project Execution Strategies that are agreed to between FTA and MTA for managing the risk associated with delivering the ESA and SAS Projects consistent with their respective revised ETPCs and RSDs. The ELPEP establishes principles for effectively and efficiently managing risk throughout project implementation, while relying on the technical capacity and capability (TCC) of MTA as the mechanism for assuring that those implementation actions can and will be met. The ELPEP recognizes that project decisions will be made by grantee management based on available information, but using processes designed to allow all material decisions to be made with an adequate consideration of relevant risks and impacts.

The ELPEP identifies the tools that MTA will use to manage risk and that FTA will use to monitor MTA's implementation of the projects.

The means of implementing the principles and tools embodied in this document will be through the integration of the ELPEP requirements into the ESA and SAS Project Management Plans (PMP) and the flow down of such requirements and scope in a traceable manner into third party contracts in the form of identifiable inputs and outputs (deliverables) that are fully integrated and coordinated between third party scopes such as the design and construction management contracts. This integration will necessitate additions/changes to the existing ESA and SAS Project Management Plans ("PMP") and subplans, which are required by statute and described in FTA Circular 5010, and will be supported by the development of separate or amended management sub-plans that MTA will use to demonstrate conformance with these ELPEP requirements.

The requirements listed in this document, however, are not exhaustive in describing all of the requirements that MTA must meet in order to establish technical capacity and capability or to prepare project management plans under other FTA documents such as, but not limited to, FTA circulars, directives, and the Full Funding Grant Agreement including the master agreement.

As part of the requirement for an acceptable PMP, MTA shall implement and maintain throughout the project, a formal PMP/sub-plan revision process for each FFGA project that accurately reflects the MTA organizational structure needed to meet FTA's TCC requirements as well as any changes that may be needed to reflect changes to the organization or the sub-plans as the project moves from final design through construction into start-up. In addition to its general responsibilities for developing and implementing an acceptable PMP for the ESA and SAS projects, MTA will be responsible for developing and incorporating new sections, subsection material, or subplans as applicable into the respective ESA or SAS PMP and for tracking and managing implementation of that ESA or SAS PMP material consistent with this ELPEP and any formal direction given by FTA consistent with this ELPEP with respect to either the ESA or SAS PMPs.

Candidate revisions or improvements to MTA's PMP will be identified through various means, tracked and reported as part of the quarterly project review process, and should include but not be limited to process-improvement proposals, measurements of the processes, lessons learned in implementing the processes, and results of process appraisal and deliverable evaluation activities. The revision process shall include the identification of the process for obtaining approval of the revisions within MTA and its agencies.

In order to accomplish the risk and contingency management goals identified by this ELPEP, the following mitigation strategies will be employed:

- Establishment of risk baselines and a mitigation framework and milestones, based on cost estimates, cost forecasts and project schedule planning, all of which will be updated quarterly, unless otherwise agreed to by the parties.
- Minimum Cost and Schedule contingency curves and cost and schedule risk management capacity, developed and implemented as needed to achieve targets including:

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- Secondary Mitigation Strategies (inclusive of any financial mechanisms determined to be appropriate) developed and implemented as necessary to offset the need to drawdown any reserved contingency.
- Design Development, Geotechnical, Real Estate and Utility risk mitigation strategies, as listed in Section IV.C of this document.

III. REQUIREMENTS FOR MTA TECHNICAL CAPACITY AND CAPABILITY (TCC)

In support of the general requirement to demonstrate it possesses technical capacity, MTA will implement and maintain a governance and organization structure, applying the principles listed below, that ensures that project management, engineering, organizational and support processes/plans/procedures inclusive of resources and authority, are defined, implemented, and maintained by the MTA organization and its various components and are sufficient to support MTA's ability to define project requirements, engage stakeholders to produce positive outcomes, allocate resources, perform project activities, monitor progress, and make adjustments, as required, so that decisions are made at the appropriate time, based on proper information; thereby ensuring continuous administrative and management direction of project operations.

1. Program and Project level decisions will be made by grantee management based on available information, using processes designed to allow all material decisions to be made with an adequate consideration of relevant risks and impacts. Management principles are meant to address these issues as a common element under all of the proposed specific risk mitigation measures, and to assure that decisions are made at the appropriate level within MTA.
2. Key points for Program and Project level decision processes include documented business decisions that establish a way to assess and allocate risk, demonstrate management control of project deliverables, provide for internal control validation, categorize specific scope management techniques, and identify senior MTACC management officials with responsibility for project level ELPEP conformance. In addition, MTA's Office of Construction Oversight and its Independent Engineering consultant will provide periodic reviews of ELPEP conformance to MTA headquarters.
3. In order for these processes to be effective, they must be reflected in MTA's ESA and SAS PMPs and MTA must implement and maintain a formal project level PMP/sub-plan revision process which, based on on-going experience, identifies candidate revisions or improvements to MTA's ESA and SAS PMPs, throughout the life of each project.
4. MTA acknowledges that program level and project level conformance with this ELPEP is key to ensuring that both the ESA and SAS projects stay within the revised budgets and schedules committed to by MTA and relied upon by FTA in establishing the revised, respective ESA and SAS ETPC and RSD.

IV. MTA's ROLES AND RESPONSIBILITIES

In addition to developing, updating, implementing, and tracking conformance with an acceptable PMP for the projects, MTA will upgrade the role of existing Cost and Schedule Management plans for both the ESA and SAS projects with requirements for current working estimates and schedules that are used to monitor contract package costs on a continuous basis, as defined in the management plans, thus alerting the grantee to the need to take early action if needed to stay on budget and/or schedule.

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a. Cost Contingency Management

For ESA in 2006 and SAS in 2007, their respective PMP scoping documents defined total contingency as being segregated into reserved and unreserved contingency as defined below:

- Unreserved Contingency is those funds, disclosed or undisclosed that are readily and freely available to absorb cost increases to the FFGA project.
- Reserved Contingency then are those funds that cannot be used or distributed to the project budget until approved by FTA.

This ELPEP document continues that classification scheme and maintains the requirement for a project level Cost Contingency Management Plan for ESA and SAS. This plan shall provide a detailed definition of what constitutes Total Contingency, Unreserved Contingency, Reserved Contingency, including identifying the amount of Reserved Contingency needed at certain milestones, and the process for distributing the Reserved Contingency. This project level Cost Contingency Management Plan for ESA and SAS, inclusive of procedures, will also address the following requirements:

- include a detailed definition of the total contingency associated with undefined and as-yet unknown requirements, expressed either as an absolute dollar amount or as a percentage reflecting the ratio of the aggregate of allocated and unallocated cost contingency in all its forms, net of financing and any allowances associated with known but undefined requirements;
- describe the manner in which MTA will forecast and trend the SAS or ESA project contingency, as part of its overall budget and progress reporting effort, including reflecting;
 - transactions that are sufficiently documented in a timely manner with no retroactive accounting actions;
 - contingency replenishment that is created by means of construction bids lower than estimated, contract underruns, value engineering; and/or
 - any secondary mitigation which is transferred back to the appropriate contingency account in a timely manner, and identified as part of total contingency;
- MTA will forecast and trend such project contingency for both ESA and SAS projects thru the next FTA "Hold Point" in the following manner; (1) where the difference between the reporting date and the next "Hold Point" is more than 12 months, MTA shall forecast/trend to the next point, (2) where the above difference is less than 12 months, MTA shall forecast/trend to two hold points, the next and its successor.
 - MTA shall forecast and trend such project cost contingency using its current working budget and integrated project schedule and the physical completion data for "Hold Points" identified in this ELPEP.
 - MTA will provide to the FTA as part of its Cost Contingency Management Process a forecast and analysis of contingency need, utilization and timing for securing the necessary funding.

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FTA and MTA have agreed to proceed with the contingency amounts identified in the project ETPC, even though these may initially be lower than the amounts that would normally be used consistent with the cost principles in TCRP Report No. G-07 (2006). The basis for this FTA decision is MTA's acceptance of the specific tools and mitigation capacities in this ELPEP. This provides FTA with reasonable assurances that these amounts will be sufficient to allow ESA and SAS to advance the projects within the contingency hold points. In order to ensure that this can be accomplished, MTA will maintain the amount of total reserved contingency identified respectively for ESA and SAS above the minimums specified in Exhibit 1 (Exhibit 1A ESA and Exhibit 1B SAS), at the times specified below, also known as "FTA Hold Points", which are defined in terms of physical completion of procurement actions for construction ("Bid") and the construction contract completion itself ("Constructed"), unless FTA agrees to allow the contingency to fall below the hold points. At the end of each of these specific time periods, MTA and FTA anticipate conducting a joint review for each project, to review among other matters, the implementation by ESA or SAS with respect to its contingency management plan and its update. MTA may also do this review as part of a program review for either project.

As part of that process, the MTA Chairman /CEO, or his designee, will seek concurrence from FTA for the release of any increment of reserved contingency identified for either project prior to the established FTA Hold Point.

ESA Reserved Contingency Minimums based on Cost Estimate Rev Feb. 2009:

- \$260 million through 90% Bid and 60% Constructed. Currently, this is forecasted to occur during Q4 2011.
- Thereafter from \$260 million in Q4 2011 to \$140 million at 100% bid and 95% constructed, currently forecasted at Q1 2015, in a straight line slope between the two points.
- Thereafter \$70 million through 100% complete on Start Up and ready for Pre-Revenue Operations. This is currently forecasted to occur at Q3 2016.

SAS Reserved Contingency Minimums based on Cost Estimate Rev 6c:

- \$220 million through 90% Bid and 50% Constructed. Currently, this is forecasted to occur during Q1 2012.
- Thereafter from \$220 million in Q1 2012 to \$140 million at 100% bid and 85% constructed, currently forecasted at Q1 2014, in a straight line slope between the two points.
- Thereafter \$45 million through 100% complete on Start Up and ready for Pre-Revenue Operations. This is currently forecasted to occur at Q2 2016.

As the ESA or SAS project cost estimates are revised and updated throughout the life of the program, the above listed time periods may shift as agreed to by FTA and MTA in any updated Cost Contingency Management Plan. Such Cost Contingency Management Planning shall also include the following:

- Evaluating the pooling of contingency resources between the ESA and SAS projects to meet intermediate or temporary funding of contingency requirements for either project with a defined schedule for repayment.
- Demonstrating with quarterly reporting throughout project implementation that business decisions on the timing or delay of project work elements that may have the benefit of reducing requirements for use of project contingency of any form or otherwise may give the appearance (real or potential) of being "fiscally constrained" are in conformance with this ELPEP.

If during project implementation the ESA or SAS contingency balances do not meet the minimum requirements of this ELPEP, MTA shall immediately implement a recovery plan or secure the needed contingency in the MTA 2015-2019 Capital Plan unless the funds are actually needed to meet committed obligations prior to 2015 in which case MTA will apply for funding in sufficient time so as not to delay the award of pending contracts and/or amendments thereto or to meet contractual obligations.

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b Schedule Contingency Management

FTA and MTA agree that in order to ensure sufficient schedule contingency for completion of the ESA and SAS projects, distribution, or consumption of schedule contingency, shall be consistent with the project level Schedule Contingency Management Plan for ESA and SAS which shall address the following requirements: (For the purposes of this ELPEP, the schedule contingency reference is interpreted as free float for the ESA or SAS project critical path or "critical path float".)

- Manage the distribution, transfer and use of all ESA or SAS project schedule contingency in conformance with this ELPEP.
- Control the distribution of all ESA or SAS project schedule contingency through independent program or project level management action with adequate internal controls that are tested regularly and by documenting the allocation of schedule contingency in a timely manner.
- Ensure that for all ESA or SAS schedule contingency that is created by means of shortened critical path activities, such as "work arounds", that realigned activities and increased float is transferred back to the appropriate schedule contingency account in a timely manner, and identified as part of total schedule contingency.
- Describe the manner in which MTA will forecast and trend the Project Level Schedule contingency, as part of its overall progress reporting effort for either the ESA or SAS project.
- Forecast and trend such project level schedule contingency in its various forms for both ESA and SAS projects thru the end of the project.
- Ensure that the amount of schedule contingency for either the ESA or SAS project throughout project implementation, which is defined in terms of physical completion of procurement actions for construction (Bid) and the construction contract completion itself ("Constructed"), and the critical path float for the project schedule, will at all times be above the minimums set forth below or in an updated Schedule Contingency Plan as the ESA and SAS projects move through final design. Currently the following time periods apply for each project:

ESA Schedule Contingency Minimums

- Based on the FFGA Revenue Service Date of April 2018, East Side Access shall maintain a minimum level of schedule contingency of 240 days through Q2 2016 at which time the schedule contingency minimums will be updated as mutually agreed. Failure to meet this requirement shall trigger the requirement for a recovery plan.
- MTA will manage the project to reflect a Current Working Schedule of September 2016.

SAS Schedule Contingency Minimums

- Based on the FFGA Revenue Service Date of February 2018, Second Avenue Subway shall maintain a minimum level of schedule contingency of 240 days through Q3 2016 at which time the schedule contingency minimums will be updated as mutually agreed. Failure to meet this requirement shall trigger the requirement for a recovery plan.

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- MTA will manage the project to reflect a Current Working Schedule date of December 2016.
- MTA will also ensure that where called for in the Schedule Contingency Plan a minimum float of 60 calendar days exists between a contract package's critical path "need date" and any ROW/Real Estate activities associated with that contract.
- Minimum differences between the individual project level critical path and the next longest path(s) (namely "near critical" paths) for both ESA and SAS shall be 25 calendar days.
- The ESA and SAS project schedule will be re-evaluated quarterly to validate the next three "near critical" paths for each project. Should the float associated with any project critical path fall below 25 calendar days, it will be reported on and analyzed each month as part of the project level Monthly Report.
- Physical configuration requirements for the critical paths of each project will be identified as part of the Schedule Management Plan.

Secondary Cost Mitigation Capacity

Separate and above the mitigation scope required by MTA's primary mitigation effort, MTA will develop an appropriate financial mechanism, as identified in the recovery plan under section 4(b) of the FFGA to handle risk events or "triggered" mitigation activities that are project phase specific. These activities arise when events occur that may include, but are not limited to, required scope changes, cost overruns, unforeseen site conditions and outside agency and force account cost and schedule impacts.

MTA's capacity to effectuate secondary mitigation for both ESA and SAS will be in accordance with the commitments outlined in the individual project FFGA, its project management plan and related subplans as well as this ELPEP.

For the ESA project, this mitigation capacity shall be a minimum of \$328million and for the SAS project, it shall be a minimum of \$307million.

The means by which such secondary cost mitigation capacity shall be secured will be developed in consultation with FTA Region 2. MTA shall take steps as part of updating its individual project capital plan (either ESA or SAS) to (1) reserve adequate bonding capacity, (2) develop sources of local funds that could be used in a timely and incremental fashion to bring the total contingency minimum balance back up to ELPEP requirements and to (3) implement expeditious coordination of any required Capital Program Review Board approvals. It is acknowledged that the needed contingency may be secured in the MTA's 2015-19 Capital Plan unless the funds are actually needed to meet committed obligations prior to 2015. MTA will provide to the FTA as part of its Cost Contingency Management Plan a forecast and analysis of contingency need and utilization and timing for securing the necessary funding.

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Secondary Schedule Mitigation Capacity

For SAS in 2007, its PMP scoping document defined secondary schedule mitigation as the capacity to effectuate schedule compression for the project critical path. This ELPEP document continues that schedule contingency scheme and maintains the requirement for secondary schedule mitigation capacity for SAS and adds it for ESA. Therefore, separate and above the mitigation scope required by the MTA's primary schedule mitigation effort for ESA and SAS, MTA shall maintain a capacity to effectuate secondary mitigation as follows:

ESA Schedule Mitigation Capacity Minimums:

- Grantee shall develop an aggregate minimum capacity of 150 calendar days of schedule compression for the critical path of the project. The development and implementation strategies for this schedule mitigation capacity shall be defined in the project specific Schedule Management Plan.

SAS Schedule Mitigation Capacity Minimums:

- Grantee shall develop an aggregate minimum capacity of 125 calendar days of schedule compression for the critical path of the project. The development and implementation strategies for this schedule mitigation capacity shall be defined in the project specific Schedule Management Plan.

c. Additional Mitigation Capacities

MTA will undertake for both the ESA and SAS projects, five specific mitigation capacities that support a design to budget approach:

- Requirements Management: Stakeholder Risk Mitigation Capacity
 - MTA shall implement and maintain a consistent and documented approach to design development inclusive of requirements documentation, interim design submissions, design related and pre-construction planning deliverables and a formal redesign process in conformance with best known industry practices.
- Requirements Management: Geotechnical Risk Mitigation Capacity
 - MTA's project implementation of geotechnical scope shall recognize and integrate two core management principles, the role of construction considerations and the use of a clearly defined, consistent work breakdown structure (WBS), or functional equivalent, by all relevant parties in both the development and review of the contract package cost and schedule.
- Requirements Risk: Real Estate and Subsurface Utility Mitigation Capacity
 - MTA's project implementation of Real Estate and Subsurface Utility scope shall recognize and integrate two core management principles, adequate design support and the identification of contingent scope within a Real Estate/Utility WBS or functional equivalent.

Design and Pre-Construction Risk: Design Development Mitigation Capacity

MTA's project implementation shall recognize and integrate the following core management principles:

- Project level WBS (PWBS) or functional equivalent must be used to integrate and relate all project work (scope, schedule, and cost) into contract WBS or functional equivalent, in order to demonstrate the traceability of contract package scope from the design basis documentation thru pre-construction planning into the contract package cost estimate and schedule.

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- The Design Consultant must provide documentation to the MTA in transmittal and status documents that discusses the state of completion for each of the specific key areas of the project design, the assumptions made, and variances from project baselines (i.e., critical issues summary) and MTA must review such data and provide technical direction to the design contractor consultant that tracks the same issues, such that a redesign late in the design cycle does not increase the risk of the project cost and schedule by undercutting these basic assumptions.
- MTA must obtain sufficient information and discussion elements on potential problems and issues within consultant progress reports in order to effectively make decisions and thereby mitigate risk.
- MTA must use design product workplans or functional equivalents to provide management with key information in the area of key assumptions and design objectives that identify major tasks for the package inclusive of design basis, design considerations, design coordination requirements, deferred package scope, and design to budget considerations.

Construction Risk: Mitigation Capacity

MTA will upon contract award, create an MTA retained risk register to provide a means for identifying and thereby managing MTA retained risks such as differing site conditions, environmental and subsurface utility risks, as well as maintaining contractor performance systems that allow MTA to quickly and consistently track and address poor contractor performance.

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V. PROJECT EXECUTION STRATEGY

The major goal of the project execution strategy for either ESA or SAS is to use the above referenced mitigation and contingency strategies, and relevant sub-plans, in tandem. The primary strategy at the project level is to maintain a total contingency balance throughout the life of the ESA or SAS projects that is acceptable to both MTA and FTA, which is determined to be sufficient to complete the Federal projects at various milestones. The secondary strategy recognizes that there is a "break point" in project execution where all market risk and early construction risk has been mitigated, beyond which the application of contingency is the only effective way to treat project risk. Prior to this "break point", risk mitigation often is required to preserve the agreed upon minimum contingency balances. MTA may apply contingency for the ESA or SAS projects, without mitigation, in those circumstances where such individual project contingency is sufficient. This requires the integration of MTA's project level risk management and contingency management activities and the creation of a secondary mitigation "trigger" if the actual contingency balance is less than the minimum contingency balances identified in the cost contingency graphic (Exhibit 1A for ESA and Exhibit 1B for SAS, hereinafter referred to as a "trigger line"). This strategy also recognizes that MTA's management of the ESA or SAS projects may create additional (new) contingency or preserve sufficient existing contingency to allow "recapture" of earlier, secondary mitigation efforts for that respective project.

FTA and MTA agree that project level risk mitigation activities need to be coordinated with respective project level contingency activities. As part of the ongoing ESA or SAS project management process, specifically, the annual update and FTA review and approval of MTA's ESA or SAS PMP, the Project Execution Graphics (inclusive of cost Exhibits 1A and 1B) attached to this ELPEP will be periodically adjusted up or down as required to reflect the current ESA or SAS cost and schedule status and MTA's past performance as well as demonstrate ESA or SAS conformance with the respective agreed upon Total Contingency and reserved contingency minimums.

MTA will coordinate its ESA and SAS Risk Management Plans and their activities with their respective Cost Contingency Management Plans and activities in order to ensure that the Total Cost Contingency, Reserved Contingency minimums for the ESA and SAS projects are preserved throughout the duration of the projects. MTA will also integrate such ESA and SAS plans and activities through the creation of a secondary mitigation capacity and related "trigger" and "recapture" opportunities (if applicable) as described below.

To accomplish this, a secondary mitigation trigger line will be established and maintained at the associated undistributed contingency minimum, as defined below and by example in the attached Exhibits 1A and 1B. MTA requirements for individual ESA or SAS project contingency (cost or schedule) where the ESA or SAS balance is greater than the associated ESA or SAS trigger lines in both cases may be satisfied by the application of either contingency, secondary mitigation, or some combination thereof. This discretion for either project to choose either contingency or secondary mitigation continues up to the point where the balance goes below the trigger line.

In those instances where the contingency balance for either project is approaching the trigger line, MTA will satisfy requirements for contingency along with the escalation of management involvement, review and reporting requirements as described in this ELPEP, the respective PMP and Contingency Management Plan.

In order to manage the ESA and SAS contingency drawdowns, MTA will:

- Report, as part of the FTA Quarterly Progress Review (QPR) meetings for that project, on the level of available contingency as compared with the predicted level on the minimum contingency balance curve, including current and forecasted trend analysis as required in Section IV a and b above of all contingency elements (Cost and Schedule);

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- Review with the PMOC for that project, at each Milestone Review Point, the Risk and Contingency Management Plans (Cost and Schedule) and Risk Mitigation Framework to examine potential risks remaining and to update the project specific Exhibit 1 graphics.

FTA Roles and Responsibilities

FTA's role is to provide oversight of MTA's efforts to mitigate the risks identified with the ESA and SAS projects and to determine that MTA at all times has the statutorily required legal, technical and financial capacity and capability to carry out the projects, consistent with established FTA requirements. It does this through on-goings reviews of MTA's implementation of the ELPEP, as reflected in the approved PMP, by identifying areas of concern, and by seeking action from MTA to remedy an identified area of concern.

To this end, FTA and its PMOC will monitor and evaluate MTA's implementation of the individual project PMPs and their sub-plans as well as the overall PES for ESA and SAS as well as the effectiveness of MTA's integration of risk and contingency mitigation activities in conformance with the requirements of this ELPEP and the FFGAs, as amended. As part of this responsibility FTA will conduct joint reviews with MTA at the end of specified milestones, to evaluate among other matters, project implementation for ESA and SAS with respect to the required sub-plans or contingency minimums for cost and schedule.

Ongoing, satisfactory conformance by MTA with this ELPEP, within the implementation timeframes established in this document (unless otherwise agreed to by the parties), and the ESA and SAS PMPs, will serve as the basis for future FTA programmatic decisions with respect to the individual projects (amendments to the existing Full Funding Grant Agreement, approval of required recovery plans, and on-going determinations that MTA continues to possess the TCC to carry out the ESA and SAS projects).

Implementation Timeframes

In addition to the TCC discussion elements above, FTA relies on a "target based" approach that integrates risk management with MTA's TCC, thereby increasing MTA's ability to mitigate risk. These targets were developed using a risk based assessment that identified specific out year cost and schedule contingency constraints for each project that MTA must meet in order to ensure that the ESA and SAS projects can be delivered on time and on budget. This ELPEP also identified certain processes that MTA must follow in providing continuous administrative and management direction of ESA and SAS project operations. It also identified areas, where if MTA falls below the targets for either project, then MTA management is required to take action to address the gap. Use of the target based approach for ESA and SAS allows FTA and MTA to agree upon implementation timeframes that lay out planned upgrades of management deliverables, such as the ESA and SAS PMP, which conform to the ELPEP requirements.

Furthermore, the ELPEP process assumes a continuing process of implementation and PMP revision as the MTA projects progress so it is not unlikely that MTA will continue to revise the ESA and SAS PMPs at key milestones or as conditions change.

The initial timeframes described below apply unless otherwise mutually agreed to by the parties: (all times below are in calendar days from the effective date of this ELPEP which is agreed upon by MTA and FTA as being January 15, 2010)

- MTA demonstrates that its PMP revision process for both ESA and SAS is in place and is being applied to the development of the next PMP revision for the respective project within 45 days.
- MTA develops and finalizes Cost and Schedule Management Plans for both ESA and SAS in conformance with ELPEP requirements within 60 days.

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- MTA develops and finalizes Cost and Schedule Contingency Management Plans for both ESA and SAS in conformance with ELPEP requirements within 60 days.
- MTA demonstrates a functioning process for achieving the traceability of contract package scope from the design basis documentation through pre-construction planning into the contract package cost estimate and schedule through a contract package level WBS or functional equivalent for one active ESA (CM014) and SAS contract package (4B) within 60 days. MTA demonstrate full conformance to all mitigation capacities on these two packages within 90 days, MTA provides FTA within 30 days with a plan to demonstrate similar ELPEP conformance on all other un-awarded contract packages for both projects.
- MTA provides FTA within 30 days with a plan for achieving TCC process conformance, consistent with Section III.1 to III.3 of this ELPEP.
- MTA demonstrates an ELPEP conformant Construction Risk mitigation capacity for active awarded contracts for ESA and SAS within 150 days.
- MTA establishes internal control baselines for ELPEP conformance reviews for ESA and SAS within 90 days, with the first oversight report delivered to FTA within 180 days.
- MTA begins monthly project level briefings to FTA on ESA and SAS PMP revisions and ELPEP conformance activities within 45 days.
- MTA achieves full, across the board, ELPEP conformance within 270 days

Enterprise Level Program Execution Plan (ELPEP)
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Exhibit 1

ESA Contingency Drawdown Curve

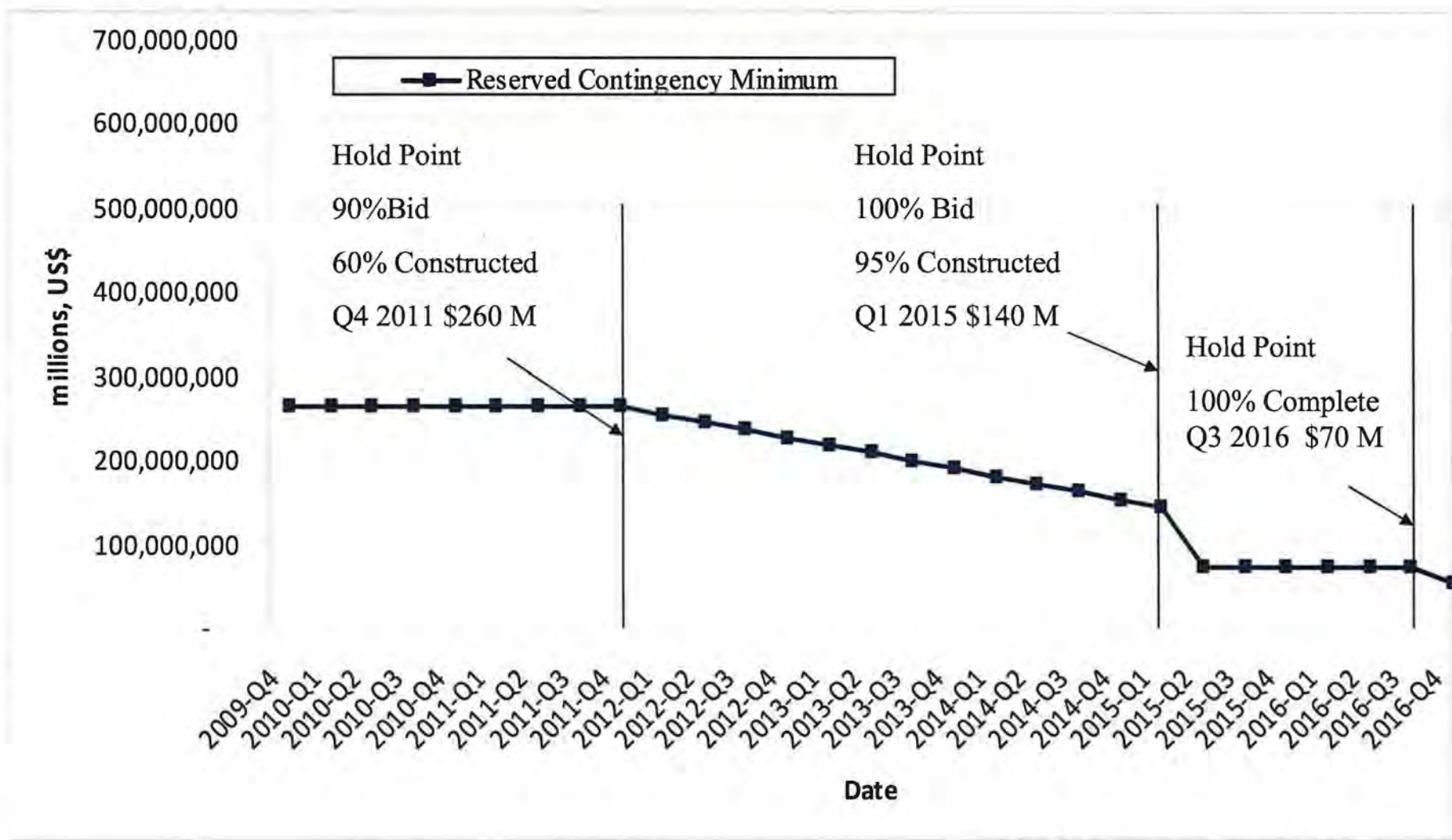


Exhibit 1A to the MTACC ELPEP
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SAS Contingency Drawdown Curve

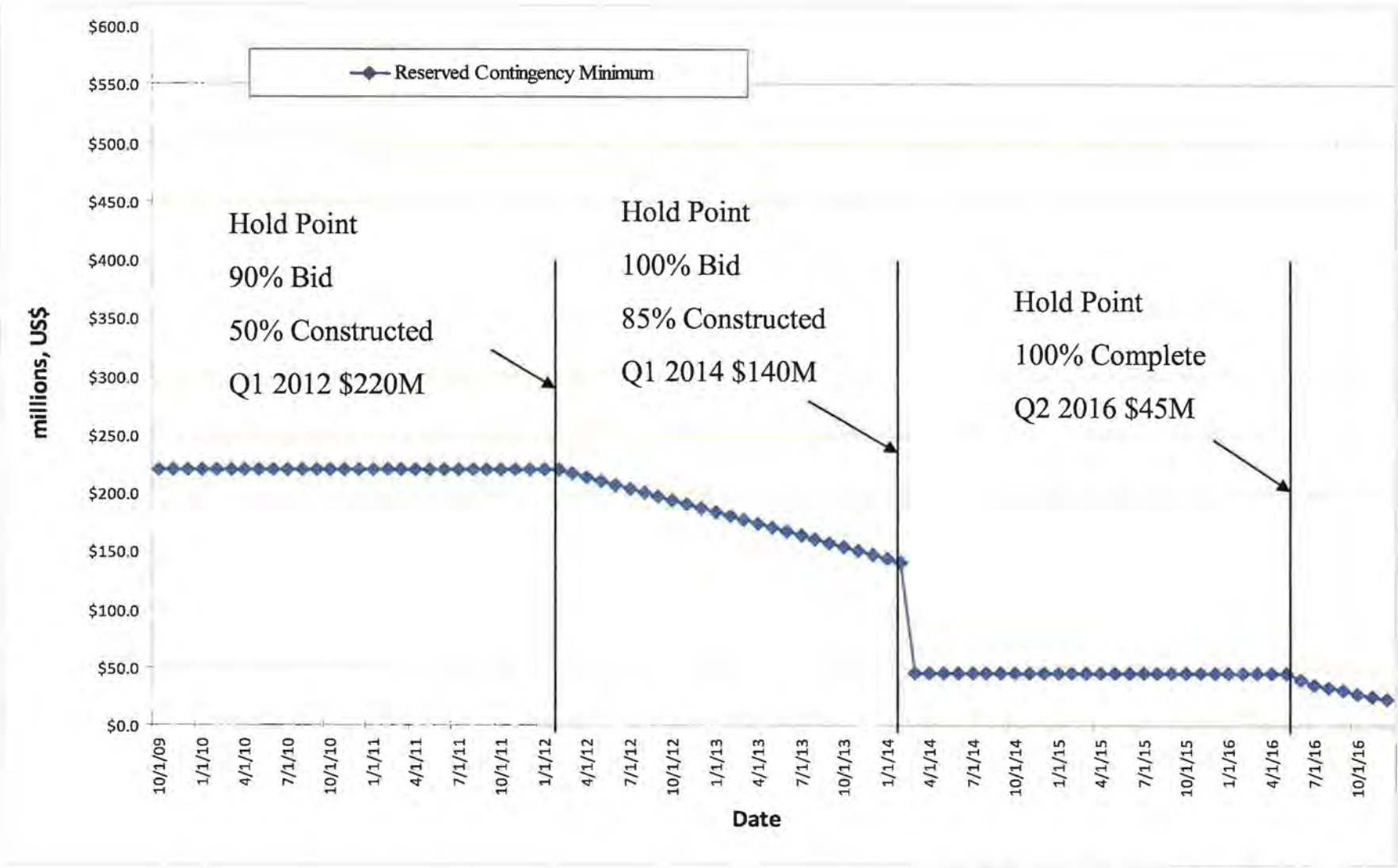


Exhibit 1B to the MTACC ELPEP
Feb 26, 2010